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Vol. 969 Number 3

OFFICIAL GAZETTE

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PATENTS

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April 18, 1978 Volume 969 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,006,186, T. L. Berry, FREE POINT INDICATOR FOR DETERMINING THE POINT AT WHICH STUCK PIPE IS FREE IN A WELL, **filed** Sept. 9, 1977, D.C., E.D. La. (New Orleans), Doc. 77–2763, *Dia-Log Company* v. *Crutcher Resources Corporation.*

3,009,235, G. De Mestral, SEPARABLE FASTENING DEVICE, **filed** May 4, 1977, D.C., S.D.N.Y., Doc. 77–C–2167, *Actief N.V.* v. *Consolidated Foods Corp.* The above-entitled action is hereby dismissed by plaintiff in accordance with Rule 41(a) of F.R.C.P., Sept. 22, 1977.

3,090,605, Copeland and Neier, FEED MIXER, **filed** Mar. 28, 1977, D.C. Colo. (Denver), Doc. 77–M–308, *B/J Manufacturing Co., Inc.* v. *Mohrland Manufacturing, Inc.* Judgment is entered against defendant for infringing of said patent, Sept. 1, 1977.

3,237,438, P. A. Tesson, PIPE LINE LAYING APPARATUS, **filed** Oct. 7, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3778–RF, *Martech Int'l Inc.* v. *Santa Fe Int'l Corp.*

3,293,665, S. Langer, POOL COVER LOCKING MECHANISM, **filed** Sept. 26, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1901, *Andray Products, Inc.* v. *Vornado, Inc.*

3,472,486, J. A. Hastings, VALVE, **filed** Oct. 7, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–2000, *John A. Hastings* v. *W. A. Baum, Co., Inc.*

3,485,736, O. A. Vesterberg, METHOD OF ISOELECTRIC FRACTIONATION, **filed** Mar. 21, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c937, *LKB-Produkter AB* v. *Brinkman Instruments, Inc.* By stipulation of the parties, it is ordered that this cause is hereby dismissed with prejudice, Sept. 1, 1977.

3,557,796, Keller, Terry and *Davies, DIGITAL COUNTER* DRIVEN PACER; **3,805,796,** Terry and Davies, IMPLANTABLE CARDIAC PACER HAVING ADJUSTABLE OPERATING PARAMETERS, **filed** Oct. 5, 1977, D.C. Mass. (Boston), Doc. 77–3044–F, *Cordis Corporation* v. *Cardiac Pacemakers, Inc. and Edward J. Luzcek.*

3,560,669, Foulkes and Bender, ECHO SUPPRESSOR, **filed** Nov. 1, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c4040, *Wescom, Inc.* v. *Tellabs, Inc.* Order that this cause is dismissed with prejudice. The order of dismissal is entered without prejudice, as to issue of patent validity, Sept. 26, 1977.

3,565,454, R. L. Stevenson, SKATEBOARD WITH INCLINED FOOT-DEPRESSIBLE LEVER, **filed** Aug. 11, 1977, D.C., N.D. Calif. (San Francisco), Doc. C77–1771–WWS, *Richard Lawrence Stevenson* v. *Sears, Roebuck and Co.*

3,628,529, W. D. Steimle, HYDRO-MASSAGE ASSEMBLY, **filed** June 30, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2444–IH, *Wayne Steimle* v. *John A. Robbins.*

3,640,595, Staller and Staller, MOTORIZED MOBILE SHELVING UNITS, **filed** Sept. 22, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3557–HP, *IPC, Inc.* v. *Spacesaver Corp.*

3,674,444, A. Otani, IRON SCRAP BUNDLES, **filed** May 28, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1452, *Akemasa Otani* v. *Tezuka Kosan Co., Ltd. et al.* Cause dismissed, Oct. 11, 1977.

3,714,462, D. E. Blackmer, MULTIPLIER CIRCUITS, **filed** Oct. 6, 1977, D.C., M.D. Tenn. (Nashville), Doc. 77–3453–NA–CV, *David E. Blackmer* v. *Allison Research, Inc.*

3,765,030, E. J. Peham, NESTABLE PLASTIC HAT WITH HEAD SIZE ADJUSTMENT, **filed** Sept. 26, 1977, D.C. M.D. Pa. (Scranton), Doc. 77–887, *Peham Plastics, Inc.* v. *Jacobson Hat Company.*

3,805,796. (See 3,557,796.)

3,827,490, Moore, Jr. and McGowen, Jr. APPARATUS FOR INSTALLING AND REMOVING FLOW VALVES, **filed** Sept. 16, 1977, D.C., N.D. Tex. (Dallas), Doc. CA3–77–1262–C, *Camco Incorporated, Perry R. Bass, Inc. and Sid W. Richardson Foundation, Inc.* v. *Teledyne Industries, Inc., doing business as Teledyne Merla.*

3,860,771, Lynn and Seeger, KEYBOARD SWITCH ASSEMBLY WITH DOME SHAPED ACTUATOR HAVING ASSOCIATED UNDERLYING CONTRACTOR MEANS, **filed** Aug. 25, 1977, D.C. Conn. (Hartford), Doc. H–77–418, *Chomerics, Inc.* v. *Hewlett-Packard Company, Incorporated.*

3,905,638, G. J. Persico, TOP AND SIDE DOOR VAN CONVERSION ASSEMBLY, **filed** Sept. 13, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3403–LEW, *Recreational Industries, Inc.* v. *National Coach Corporation.*

3,919,407, A. L. Fernandez de Castro, METHOD FOR QUANTITATIVE DETERMINATION OF RENIN ACTIVITY IN BLOOD, **filed** Sept. 23, 1977, D.C. N.J. (Trenton), Doc. 77–1989, *Aurora Fernandez de Castro et al.* v. *Baxter Travenol Laboratories, Inc. et al.*

3,961,460, Jelling, Kahn, Moore and Friedman, BAGGING APPARATUS WITH BAG SPREADING DEVICE AND BRAKING DEVICE; **3,987,603,** same, BAGGING PROCESS; **3,990,625,** same, SPECIAL BAGS FOR BAGGING APPARATUS; **4,027,461,** same, FLOATING HOOK ARRANGEMENT FOR AN APPARATUS FOR BAGGING GARMENTS, **filed** Sept. 8, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1813, *Poly-Pak Industries, Inc.* v. *Murray Jelling et al.*

3,973,095, T. R. Greene, INTRUSION DETECTOR SENSITIVE TO RESONANT FREQUENY OF BREAKING GLASS, **filed** Oct. 4, 1977, D.C., N.D. Calif. (San Francisco), Doc. C77–2213–WWS, *Emergency Products Corp.* v. *United Security Products Inc. et al.*

3,990,625. (See 3,961,460.)

3,987,603. (See 3,961,460.)

3,999,050, S. G. Pitroda, ELECTRONIC DIARY, **filed** Aug. 31, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3246, *Satyan G. Pitroda* v. *American Express Company.* Notice of dismissal pursuant to Rule 41(a)(1)(1), Oct. 3, 1977.

4,027,461. (See 3,961,460.)

4,035,132, T. M. Smith, GAS-FIRED RADIANT HEATER, **filed** Oct. 4, 1977, D.C., N.D. Ohio (Cleveland), Doc. C77–1058, *Slyman Manufacturing Corp.* v. *Hunt Associates, Inc.*

Re. 26,267, B. H. Matthews, ELECTRICAL SWITCH WITH CAMMING BRIDGING CONTACT, **filed** in the United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 76–1983, *Lucerne Products, Inc. et al* v. *Cutler-Hammer, Inc.* Judgment, said reissue is invalid for obviousness. The judgment of the District Court is vacated and dismissal of Lucerne's infringement action is remanded, Sept. 29, 1977.

P.P. 2,434, K. K. Meserve, ILEX (HOLLY) PLANT, **filed** Sept. 16, 1977, D.C.N.J. (Camden), Doc. C–77–1936, *The Conrad-Pyle Company* v. *Ray Contarino and Raycon Windy Acres, doing business as Windy Acres Nursery.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,098,578, Re. S.N. 869,978, Filed Dec. 29, 1977, Cl. 220/5, PRESSURE VESSEL, John Rudelick, Owner of Record: *Park International Corp., Long Beach, Calif.,* Attorney or Agent: Ira Milton Jones, et al., Ex. Gp.: 241

3,395,800, Re. S.N. 856,195, Filed Nov. 30, 1977, Cl. 210/66, SEWAGE TREATMENT AND APPARATUS THEREFOR, Leon S. Kraus, et al., Owner of Record: *Ecodyne Corp., Chicago, Ill.,* Attorney or Agent: Fred S. Lockwood, et al., Ex. Gp.: 177

3,874,932, Re. S.N. 865,907, Filed Dec. 30, 1977, Cl. 429/200, DRY CELLS, Yoshio Uetani, et al., Owner of Record: *Hitach Maxell, Ltd., Osaka, Japan,* Attorney or Agent: Raymond C. Stewart, et al., Ex. Gp.: 114

3,911,202, Re. S.N. 875,591, Filed Feb. 6, 1978, Cl. 174/120 SR, ELECTRICAL CONDUCTORS INSULATED WITH ELECTRON CURED ELASTOMER, Clifford R.

Stine, et al., Owner of Record: *Samuel Moore & Co., Mantua, Ohio,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 213

3,939,145, Re. S.N. 878,938, Filed Feb. 17, 1978, Cl. 536/4, NOVEL ETHEREALLY MONOSUBSTITUTED MONOSACCHARIDES, Paul Gordon, Owner of Record: *Strategic Medical Research Corp., Greenwich, Conn.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 124

3,939,146, Re. S.N. 878,937, Filed Feb. 17, 1978, Cl. 536/4, NOVEL ETHEREAL MONOSUBSTITUTIONS OF MONOSACCHARIDE DERIVATIVES, Paul Gordon, Owner of Record: *Strategic Medical Research Corp., Greenwich, Conn.,* Attorney or Agent: Joseph M. Lane, et al., Ex. Gp.: 124

3,940,897, Re. S.N. 879,797, Filed Feb. 21, 1978, Cl. 52/395, STRUCTURAL ASSEMBLIES, Richard Lewis Stoakes, Owner of Record: *Inventor,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 354

4,002,572, Re. S.N. 866,179, Filed Dec. 30, 1977, Cl. 252/99, ALKALINE PROTEASE PRODUCED BY A BACILLUS, Bauke te Nijenhuis, Owner of Record: *Gist-Brocades N.V. Delft, The Netherlands,* Attorney or Agent: Nelson Littell, et al., Ex. Gp.: 166

4,034,717, Re. S.N. 872,015, Filed Jan. 25, 1978, Cl. 122/359, MULTI-SECTION HEAT EXCHANGER MEANS, David N. Clum, et al., Owner of Record: *Heater Technology, Inc., Ponca City, Okla.,* Attorney or Agent: William R. Laney, et al., Ex. Gp.: 342

4,043,113, Re. S.N. 879,310, Filed Feb. 21, 1978, Cl. 58/23 BA, ELECTRIC WATCH BATTERY RETAINER, William D. Hart, Owner of Record: *Hughes Aircraft Company, Culver City, Calif.,* Attorney or Agent: W. H. MacAllister, Ex. Gp.: 217

PATENT NOTICES

Certificates of Correction for the Week of Apr. 18, 1978

P.P. 4,087	4,026,115	4,053,520	4,060,532
P.P. 4,167	4,026,927	4,053,528	4,060,642
Re. 29,346	4,027,251	4,053,555	4,060,796
Re. 29,417	4,028,218	4,053,836	4,060,799
D. 242,401	4,029,900	4,053,871	4,060,885
D. 246,717	4,030,123	4,054,219	4,060,933
3,524,956	4,030,409	4,054,353	4,061,101
3,777,649	4,031,077	4,055,427	4,061,270
3,804,879	4,032,419	4,055,842	4,061,868
3,810,003	4,034,023	4,056,181	4,061,941
3,886,276	4,034,774	4,056,409	4,062,158
3,894,747	4,035,225	4,057,007	4,062,263
3,933,891	4,035,415	4,057,050	4,062,341
3,936,948	4,036,030	4,057,448	4,062,594
3,946,138	4,036,360	4,057,475	4,062,668
3,957,988	4,036,954	4,057,497	4,063,187
3,960,866	4,037,487	4,057,579	4,063,391
3,964,898	4,038,664	4,057,590	4,063,466
3,969,723	4,038,886	4,057,644	4,063,677
3,971,501	4,040,039	4,057,645	4,063,738
3,978,156	4,040,992	4,057,723	4,063,839
3,982,103	4,041,064	4,057,736	4,064,284
3,982,183	4,042,044	4,058,200	4,064,334
3,987,067	4,042,059	4,058,261	4,064,525
3,989,118	4,042,612	4,058,293	4,064,741
3,989,957	4,042,974	4,058,404	4,064,983
3,991,072	4,043,318	4,058,476	4,065,121
3,999,214	4,043,327	4,058,553	4,065,135
4,001,395	4,043,344	4,058,643	4,065,186
4,003,042	4,043,739	4,058,715	4,065,240
4,004,161	4,044,060	4,058,794	4,065,395
4,007,627	4,044,541	4,058,891	4,065,587
4,011,704	4,045,491	4,059,199	4,065,729
4,011,894	4,045,493	4,059,221	4,065,803
4,012,061	4,046,611	4,059,287	4,066,279
4,012,229	4,046,995	4,059,420	4,066,438
4,013,693	4,047,447	4,059,478	4,066,451
4,013,763	4,047,533	4,059,479	4,066,618
4,014,445	4,047,601	4,059,512	4,066,625
4,014,752	4,049,734	4,059,545	4,066,684
4,015,339	4,049,847	4,059,658	4,066,690
4,015,756	4,050,887	4,059,680	4,067,023
4,015,907	4,051,103	4,059,699	4,067,073
4,016,763	4,051,159	4,059,712	4,067,102
4,018,507	4,051,309	4,059,725	4,067,165
4,018,853	4,051,523	4,059,875	4,067,249
4,019,697	4,051,820	4,059,876	4,067,430
4,021,564	4,052,000	4,059,925	4,067,594
4,023,496	4,052,313	4,060,035	4,067,608
4,024,428	4,052,936	4,060,042	4,067,646
4,025,426	4,053,276	4,060,322	4,067,779
4,025,976	4,053,296	4,060,433	4,068,005

Disclaimers

3,253,613.—*Robert R. Richolt,* Bellevue, Wash. FAIL SAFE SERVO VALVE. Patent dated May 31, 1966. Disclaimer filed Jan. 20, 1978, by the assignee, *The Boeing Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 9, 10, 11, 12 and 13 of said patent.

3,355,298.—*Ira Loter,* Fair Lawn, N.J. PROCESS OF MAKING CHEMICALLY ACIDIFIED SOUR CREAM TYPE PRODUCTS. Patent dated Nov. 28, 1967. Disclaimer filed Feb. 13, 1978, by the assignee, *Diamond Shamrock Corporation.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,437,494.—*Ira Loter,* Fair Lawn, and *John E. Long,* Murray Hill, N.J. PROCESS FOR MAKING CHEMICALLY-ACIDIFIED SOUR CREAM TYPE PRODUCT. Patent dated Apr. 8, 1969. Disclaimer filed Feb. 13, 1978, by the assignee, *Diamond Shamrock Corporation.*

Hereby enters this disclaimer to claims 1, 4 and 7 of said patent.

3,818,447.—*David John Craft,* Chandlers Ford, England. PRIORITY DATA HANDLING SYSTEM AND METHOD. Patent dated June 18, 1974. Disclaimer filed Jan. 26, 1978, by the assignee, *International Business Machines Corporation, Inc.*

Hereby enters this disclaimer to claims 1 through 12 of said patent.

3,823,576.—*John B. Colletti,* Grosse Point Park, and *Leonard J. Zukowski,* Sterling Heights, Mich. UNIVERSAL JOINT FOR VEHICLE STEERING COLUMN. Patent dated July 16, 1974. Disclaimer filed Dec. 5, 1977, by the assignee, *TRW Inc.*

Hereby enters this disclaimer to claims 1–6 of said patent.

3,850,687.—*Werner Kern,* Belle Mead, N.J. METHOD OF DENSIFYING SILICATE GLASSES. Patent dated Nov. 26, 1974. Disclaimer filed Mar. 1, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 through 7 of said patent.

3,862,645.—*Donald L. Bianchetta,* Coal City, and *Kenneth R. Lohbauer,* Joliet, Ill. PILOT CONTROL VALVE. Patent dated Jan. 28, 1975. Disclaimer filed Feb. 13, 1978, by the assignee, *Caterpillar Tractor Co.*

Hereby enters this disclaimer to claims 3 and 4 of said patent.

3,890,347.—*David Middlemiss,* London, England. ISOINDOLINE DERIVATIVES. Patent dated June 17, 1975. Disclaimer filed Feb. 21, 1978, by the assignee, *Allen & Hanburys Limited.*

Hereby enters this disclaimer to claim 48 of said patent.

3,909,845.—*Kurt Rothlisberger,* Morton Grove, and *Richard F. Vee,* Chicago, Ill. APPARATUS AND METHOD FOR SENSING THE CONDITION OF A TAPE WITHIN A TAPE CASSETTE. Patent dated Sept. 30, 1975. Disclaimer filed Feb. 9, 1978, by the assignee, *Teletype Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

3,928,037.—*Louis Maria De Haes,* Edegem, Belgium, and *Hans-Georg Völz,* Krefeld-Bockum, Germany. TITANIUM DIOXIDE WITH ALUMINUM OXIDE OR ALUMINUM OXIDE PLUS SILICON DIOXIDE PRECIPITATED THEREON AS PIGMENT FOR DIFFUSION TRANSFER. Patent dated Dec. 23, 1975. Disclaimer filed Dec. 12, 1977, by the assignee, *Agfa-Gevaert N.V.*

Hereby enters this disclaimer to claims 1–25 of said patent.

3,937,812.—*James Long Bittle,* Doylestown, Pa., and *Wayne J. Rubic,* Titusville, N.J. FELINE CALICIVIRUS VACCINE AND PRODUCTION THEREOF. Patent dated Feb. 10, 1976. Disclaimer filed Feb. 27, 1978, by the assignee, *Pitman-Moore, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,939,718.—*James W. Banks,* Bozman, Md. MECHANISM TO CONVERT ROTARY MOTION TO TRANSVERSE

MOTION. Patent dated Feb. 24, 1976. Disclaimer filed Feb. 13, 1978, by the assignee, *Chemetron Corporation.*

Hereby enters this disclaimer to claims 1–7 of said patent.

3,954,273.—*Harry B. Shaper,* East Hills, and *Donald G. Litcher,* Commack, N.Y. PHONOGRAPH PICKUP CARTRIDGE. Patent dated May 4, 1976. Disclaimer filed Nov. 25, 1977, by the inventors.

Hereby enter this disclaimer to claims 1, 2 and 3 of said patent.

3,981,716.—*Eugene G. Teach,* El Cerrito, Calif. GEM-BIS AMIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHODS OF USE. Patent dated Sept. 21, 1976. Disclaimer filed Nov. 21, 1977, by the assignee, *Stauffer Chemical Company.*

Hereby enters this disclaimer to claims 1 through 28 of said patent.

4,007,235.—*Leigh E. Walker,* Lewiston, N.Y. METHOD OF PREPARING VINYL HALIDE POLYMERS AND COPOLYMERS WITH POLYOLEFINS. Patent dated Feb. 8, 1977. Disclaimer filed Nov. 21, 1977, by the assignee, *Hooker Chemicals & Plastics Corp.*

Hereby enters this disclaimer to claim 10 of said patent.

4,023,185.—*Allen Bloom,* East Windsor, *Robert Alfred Bartolini,* Trenton, and *Alan Edward Bell,* East Windsor, N.J. ABLATIVE OPTICAL RECORDING MEDIUM. Patent dated May 10, 1977. Disclaimer filed Feb. 22, 1978, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 5 and 12 of said patent.

4,033,030.—*Max S. Robinson,* Richland, Wash., and *Thomas J. Studebaker,* Boulder, Colo. METHOD OF MANUFACTURING KEYSWITCH ASSEMBLIES. Patent dated July 5, 1977. Disclaimer filed Feb. 10, 1978, by the assignee, *Mohawk Data Sciences Corp.*

The term subsequent to Apr. 19, 1994 has been disclaimed.

Dedication

3,976,370.—*Narendra S. Goel,* Henrietta, and *Gerald M. Fletcher,* Pittford, N.Y. BELT TRANSFER AND FUSING SYSTEM. Patent dated Aug. 24, 1976. Dedication filed Feb. 6, 1978, by the assignee, *Xerox Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

3,599,409.—*Martin J. Whitney,* East Moline, and *William L. Forsberg,* Moline, Ill. MAIN FRAME FOR CORN HEADS. Patent dated Aug. 17, 1971. Disclaimer filed Dec. 12, 1977, by the assignee, *International Harvester Company.*

Hereby enters this disclaimer to all claims and dedicates to the Public the remaining term of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator, National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW.,
Washington, D.C. 20314

Patent application 838,437. Nonvolatile Punch Through Memory Cell. Filed Sept. 30, 1977.

Patent application 844,082. High Pressure Hydrazine Gas Generator. Filed Oct. 20, 1977.

Patent application 850,327. Line-of-Sight Stabilization Reflector Assembly. Filed Nov. 10, 1977.

Patent application 852,771. Internal Arresting Beam Clipper. Filed Nov. 18, 1977.

Patent 4,057,899. Staked Bearing Cutter. Filed Jan. 5, 1977. Patented Nov. 5, 1977. Not available NTIS.

Patent 4,058,002. Dispersive Electromagnetic Surface Acoustic Wave Transducer. Filed Dec. 23, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,058,263. Adjustable Pintle Spray Manifold Assembly. Filed Aug. 16, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,058,413. Ion Implantation Method for the Fabrication of Gallium Arsenide Semiconductor Devices Utilizing an Aluminum Nitride Protective Capping Layer. Filed May 13, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,059,343. Prismatic Anamorphic System for Optical Correlators. Filed Feb. 26, 1976. Patented Nov. 22, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research, Code 302, Arlington, Va. 22217

Patent application 728,709. Process to Remove Iron Sulfide From Coal to Reduce Pollution. Filed Oct. 1, 1976.

Patent application 740,690. Twin Electric Microstrip Dipole Antennas. Filed Nov. 10, 1976.

Patent application 740,691. Coupled Fed Magnetic Microstrip Dipole Antenna. Filed Nov. 10, 1976.

Patent application 740,692. Circularly Polarized Electric Microstrip Antennas. Filed Nov. 10, 1976.

Patent application 740,693. Offset Fed Magnetic Microstrip Dipole Antenna. Filed Nov. 10, 1976.

Patent application 826,508. Gas-Actuated Valves. Filed Aug. 22, 1977.

Patent application 833,425. Repeatable Release Holdback Bar. Filed Sept. 15, 1977.

Patent application 838,696. Separable Fiber Optic Cable Connector. Filed Oct. 3, 1977.

Patent application 840,201. Pilot Training Simulator. Filed Oct. 7, 1977.

Patent application 846,945. Fiber Optic Coupler. Filed Oct. 31, 1977.

Patent application 849,738. Digital C/kT Meter. Filed Nov. 16, 1977.

Patent 3,989,944. Parallel-Beam X-Ray Optics for Measuring Asbestos. Filed Sept. 5, 1975. Patented Nov. 2, 1976. Not available NTIS.

Patent 4,027,938. Fiber Optic Cable Connector. Filed July 1, 1976. Patented June 7, 1977. Not available NTIS.

Patent 4,033,388. Bending and Cutting Tool. Filed May 3, 1976. Patented July 5, 1977. Not available NTIS.

Patent 4,042,830. Solid State Programmable Dynamic Load Simulator. Filed Nov. 25, 1975. Patented Aug. 16, 1977. Not available NTIS.

Patent 4,047,990. Plastic Bonded Explosive Composition. Filed Aug. 1, 1967. Patented Sept. 13, 1977. Not available NTIS.

Patent 4,054,786. Running Average Computer. Filed Sept. 24, 1973. Patented Oct. 18, 1977. Not available NTIS.

Patent 4,056,789. Electric Discharge Gas Dynamic Laser. Filed July 2, 1976. Patented Nov. 1, 1977. Not available NTIS.

Patent 4,062,057. Regulated Power Supply Having a Series Arrangement of Inverters. Filed Apr. 15, 1977. Patented Dec. 6, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW.,
Washington, D.C. 20314

Patent application 837,135. Single Dispersive Delay Line Compressive Receiver. Filed Sept. 28, 1977.

Patent application 841,776. Ramp Toe Stowage System. Filed Oct. 13, 1977.

Patent application 844,163. Parachute Canopy Deployment Control Apparatus. Filed Oct. 21, 1977.

Patent application 848,622. Degasser and Liquid Seal Reservoir. Filed Nov. 4, 1977.

Patent application 852,112. Parachute Inspection Arch. Filed Nov. 16, 1977.

Patent 4,058,141. Supersonic Flow Diffuser With Energy Redistribution. Filed July 19, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,058,331. Remotely Actuated Two Stage Structural Latch. Filed Oct. 29, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,058,734. Passive Infrared Resolution Target. Filed July 19, 1976. Patented Nov. 15, 1977. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research,
Code 302, Arlington, Va. 22217

Patent application 828,562. Liquid Propellant Gun Breech Pressure Axial Injector. Filed Aug. 29, 1977.

Patent application 831,635. Wing in Ground Effect Vehicle. Filed Sept. 8, 1977.

Patent application 833,852. Ignitor. Filed Sept. 16, 1977.

Patent 3,351,463. High Strength Nickel-Base Alloys. Filed Aug. 20, 1965. Patented Nov. 7, 1967. Not available NTIS.

Patent 3,594,239. Method of Treating Unique Martensitic Alloys. Filed Feb. 26, 1968. Patented July 20, 1971. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 11, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-11-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-8-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-20-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-11-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-10-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-10-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	6-15-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-3-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	2-16-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-18-77

Expiration of patents: The patents within the range of numbers indicated below expire during March 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,973,519 to 2,977,597, inclusive
Plant Patents..... Numbers 2,032 to 2,039, inclusive

REISSUES

APRIL 18, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,611

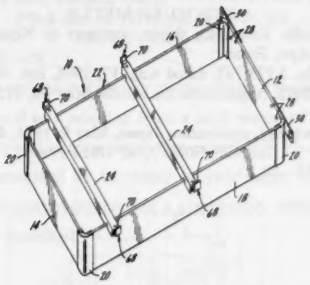
BED BASE FOR SUPPORTING A BOX SPRING

James Roger Lawrence, Carthage, Mo., assignor to Steadley Company, Inc., Carthage, Mo.

Original No. 3,869,738, dated Mar. 11, 1975, Ser. No. 432,659, Jan. 11, 1974. Application for reissue Dec. 17, 1976, Ser. No. 751,643

Int. Cl.[2] A47C *19/00*

U.S. Cl. 5—200 R 16 Claims



1. A bed base for supporting a box spring for a mattress and elevating said box spring a predetermined distance above a floor, comprising

panels of equal width resting on their edges and connected at their ends to form a rectangular frame,

[a pair of notches in] *at least one notch formed in each of* a pair of opposed panels at the upper edges in each one of said opposed panels, said [pair of] notches in one panel being in registration with the [pair of] notches in the other panel, and

[a pair of spaced cross-supports] *at least one cross-support* resting crosswise between the pair of notched panels, each of said cross-supports having a generally flat support surface which is generally parallel to the floor and on which the box spring rests, and a downwardly pointing brace,

each of said cross-supports being at right angles to the notched panels and aligned with opposed notches in opposed notched panels so that the respective braces of each one of said cross-supports nest in the opposed notches and the support surfaces of said cross-supports are essentially flush with the unnotched portion of the notched edges of said panels.

Re. 29,612

MACHINE TOOL WITH INDEXIBLE TOOL SUPPORT

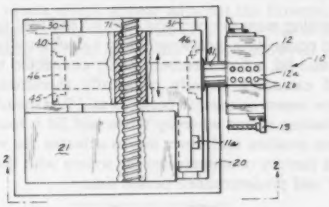
Baxter T. Fullerton, Cleveland, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Original No. 3,835,516, dated Sep. 17, 1974, Ser. No. 292,982, Sep. 28, 1972. Continuation-in-part of Ser. No. 148,729, Jun. 1, 1971, abandoned. Application for reissue Sep. 14, 1976, Ser. No. 723,308

Int. Cl.[2] B23B *3/18*

U.S. Cl. 29—47 20 Claims

1. A machine tool comprising a frame, a rotatable member having an axis of rotation and having an outer end for supporting a workpiece to be machined for rotation with said member about said axis, an indexible tool support displaced to one side of said axis and comprising means for mounting tools on said tool support in a plurality of angular positions about an indexing axis parallel to said axis of rotation, a carrier, means supporting said tool support on said carrier for indexing movement relative to said carrier to index said tools to a position for machining a workpiece and for advance movement relative to said carrier in a work stroke parallel to said axis of rotation to effect the machining of said workpiece and for return movement, said tool support projecting outwardly of said carrier in a direction parallel to said axis of rotation to a retracted position and movable toward said carrier from said retracted position to a maximum advanced position, which positions define the maximum work stroke of said tool support, means supporting said carrier for movement toward and away from said axis to move a tool on said tool support transversely of said axis of rotation, said means supporting said carrier being disposed on said frame alongside said rotatable member and comprising a way extending transversely to said axis of rotation and alongside said rotatable member, and power driven means operatively connected to said tool support for indexing the latter and moving it through its work stroke.



5. An machine tool as define in claim 1 wherein said tool mounting means of said tool support comprises means for mounting a turning tool with its cutting edge in a plane to machine the outer periphery of a workpiece at least at the beginning of the work stroke with the tool support in its retracted position and for mounting an end-working tool with its cutting edge in said plane and at least a shank portion of the end-working tool extending parallel to the axis of the rotatable member for a distance at least approximately equal to the length of the maximum work stroke of said tool support whereby said end working tool is adapted to machine the workpiece inwardly from the outer end thereof for substantially the full length of the maximum work stroke as the tool support is moved through its work stroke, and said driven means comprising means for moving said tool support relative to said carrier in a direction substantially parallel to the axis of said rotatable member in different length work strokes.

Re. 29,613

INHALER APPARATUS

Georg Kropfhammer, Seebruck, Germany

Original No. 3,964,478, dated Jun. 22, 1976, Ser. No. 489,898, Jul. 19, 1974. Application for reissue Apr. 11, 1977, Ser. No. 786,475

Claims priority, application Germany, Jul. 19, 1973, 2336879; Jun. 20, 1974, 2429508

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—203 22 Claims

1. An inhaler apparatus comprises a housing and a breathing system mounted within said housing;

said breathing system includes a source of gas, an applicator for said gas, a feed hose connected between said source and said applicator, and valve means for controlling the flow of said gas to said applicator;

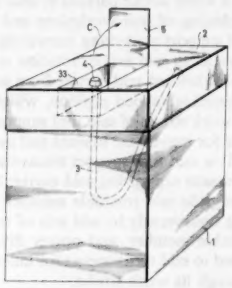
said housing includes a lid which is movable between an open position in which said applicator can be withdrawn

from said housing and a closed position which prevents access to said applicator;

locking means to hold said lid in said closed position, and unlocking means to disengage said locking means;

timer means connected to said valve means for actuating said valve means for a predetermined period of time;

actuating means connected to said timer means for actuating said timer means; and



connecting means connecting said lid and said timer means, said connecting means including a shaft fixedly connected to said lid; a first member fixedly connected to said shaft and extending radially outwardly therefrom, and first lever means connected between said first member and said actuating means whereby when said lid is moved into an open position said timer means actuates the valve means and thereby communicates the source with the applicator for said predetermined period time.

Re. 29,614

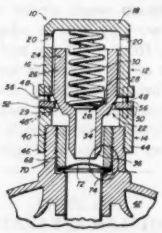
RUPTURING HEAD FOR FIRE EXTINGUISHERS

William J. Zehr, Des Plaines, Ill., assignor to The Protectoseal Co., Bensenville, Ill.

Original No. 4,006,780, dated Feb. 8, 1977, Ser. No. 689,098, May 24, 1976. Application for reissue Mar. 4, 1977, Ser. No. 774,375

Int. Cl.² A62C *35/02*; F16K *13/04*; A62C *37/30*

U.S. Cl. 169—26 **4 Claims**



1. A head for rupturing a disk in the cylindrical neck of a container for emission of fire extinguishing material, said neck having male threads around the exterior wall of the neck and a rupturable disk in said neck, in combination with a hollow housing having a top and side wall, the upper portion being cylindrical, and having an integrally formed substantially square in cross-section lower portion, *an opening in said cylindrical upper portion,* said lower portion having a top and side and end walls, the lower end of said lower portion being internally threaded for securement to the neck of the container, said lower portion provided with a pair of opposed slots in said side walls and partially into said end walls, a pair of vertically disposed roll pins anchored to said side walls and each spanning one of said slots, a hollow punch having a cylindrical spring loaded seat positioned interiorally in the upper portion of said housing and a hollow tubular member integrally formed on the lower end of said seat and offset from said seat, the free end of said tubular member being sharpened to form a cutting edge, a pair of arms each positioned in one of said slots, one end of each of said arms pivotally secured to one of said roll pins, a hooked portion on the opposite end of each of said arms and a fusible link secured to said hooked portions to position said arms in parallel and support said seat in inoperative position.

Re. 29,615

OFF-PHOTOMETRIC-RANGE INDICATOR FOR EXPOSURE METER

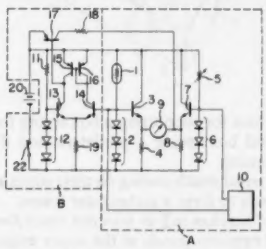
Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Original No. 3,975,747, dated Aug. 17, 1976, Ser. No. 573,396, May 1, 1975. Application for reissue May 13, 1977, Ser. No. 796,659

Claims priority, application Japan, May 9, 1974, 49-51645[U]

Int. Cl.² G03B *7/00*; G01J *1/44*

U.S. Cl. 354—60 E **7 Claims**



1. In a device for indicating off-photometric-range of a photometric circuit in an exposure indicator, the indicating device including:

a photometric circuit [(1, 2)] adapted to generate a first voltage in correspondence to the object brightness of an object to be photographed;

an exposure factor introduction circuit [(5, 6)] adapted to generate a second voltage which varies according to exposure factors; and

an indicator [(9) connected at one input terminal to said photometric circuit and at its other input terminal to said exposure factor introduction circuit and] adapted to indicate a proper value of exposure corresponding to the difference between said first and second voltages,

the improvements comprising:

a. a detection circuit [(11, 12, 13, 13, 15, 16, 19)] connected to said photometric circuit and adapted to detect the object brightness and issue an output signal when the detected value of the object brightness is off the photometric range of said [indicator,] *photometric circuit;*

b. a switching circuit [(17, 25)] connected to said detection circuit and arranged to operate when receiving said output signal; and

c. a circuit [(18, 26, 27)] connected between said switching circuit and said indicator and actuated by operation of said switching circuit to scale out said indicator thereby to give the off-photometric-range indication.

PLANT PATENTS

GRANTED APRIL 18, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,241

ROSE PLANT

Jan Van Veen, Aalsmeer, Netherlands, assignor to Carlton Rose Nurseries, Inc., Carlton, Oreg.

Filed Apr. 5, 1977, Ser. No. 784,782
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from a seed parent of the White Satin variety and an unnamed pollen parent U.S. Plant Pat. No. 2,603 characterized by its ability to yield large long lasting blooms on a continuous basis in a greenhouse, substantially as shown and described.

4,242

DOGWOOD TREE — IMPERIAL WHITE VARIETY

Elizabeth Parris Blow, 911 Westwood Dr., Raleigh, N.C. 27607, and Muriel Fiscus Steppe, 3800 New Bern Ave., Raleigh, N.C. 27610

Filed Jan. 24, 1977, Ser. No. 762,120
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of white Flowering Dogwood tree, botanically known as *Cornus florida,* substantially as illustrated and described, characterized particularly as to novelty by the unique combination of (1) the unusually large size of solid white bracts which appear adjacent the flowers, (2) the unusually large size of the leaves, (3) a more vigorous and a more spreading growth habit, and (4) an improved drought tolerance.

PATENTS

GRANTED APRIL 18, 1978

ERRATA

For CLASS	See PATENT NO.
053–112 A	4,084,390
053–120	4,084,391
053–131	4,084,392
053–137	4,084,393
056–014.6	4,084,394
056–015.4	4,084,395
056–098	4,084,396
056–255	4,084,397
057–034 R	4,084,398
057–140 C	4,084,399
057–156	4,084,400
058–004 A	4,084,401
058–023 R	4,084,402
058–023 D	4,084,403
0589–050 R	4,084,404
081–010	4,084,460
181–241	4,084,658
297–453	4,084,775
366–177	4,084,795
366–137	4,084,796
316–019	4,084,871
350–151	4,084,908
209–071	4,085,038
252–470	4,085,131
560–075	4,085,132
526–122	4,085,276
544–027	4,085,277
544–111	4,085,278
544–111	4,085,279
544–140	4,085,280
544–185	4,085,281
544–197	4,085,282
544–214	4,085,283
235–306	4,085,312
235–419	4,085,313
235–487	4,085,314
362–116	4,085,315
362–016	4,085,316
362–072	4,085,317
362–217	4,085,318

PATENTS

GRANTED APRIL 18, 1978

GENERAL AND MECHANICAL

4,084,264
BATTER TRAINING SAFETY JACKET
Sebastino T. Marion, 28029 Elmdale, St. Clair Shores, Mich. 48081
Filed Apr. 9, 1976, Ser. No. 675,578
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—2 **4 Claims**

1. In a jacket for a batter playing baseball, the improvements comprising:
a body portion;
a sleeve portion;
said sleeve portion being affixed to the left side of said body portion;
said sleeve portion having a first relatively thin fabric portion;
said sleeve portion having a relatively thick padding portion;
said sleeve padding portion located on said sleeve portion in such a manner that said padding covers the elbow and adjacent fore arm and adjacent upper arm regions;
said sleeve portion having a relatively thin fabric portion at the interior crux of the elbow;
said body portion having padding extending from the buttocks to the neck on the back thereof and extending from the thigh through collar bone in a vertical direction, and in a horizontal direction to the beginning of the rib cage on the front of said jacket said body portion comprising a back portion with integral left and right front vest portions;
said right portion of said jacket being sleeveless;
adjustable fastening means attached to the left and right front vest portions of said jacket;
said fastening portions having means for quickly engaging and disengaging the fasteners for fastening said jacket front portions in a safety position and for defastening said portions for quick removal of said jacket.

4,084,265
PROTECTIVE GLOVE
Bertil Anfelt, Stockholm, Sweden, assignor to Landstingens Inkopscentral, Lic, Ekonomisk Forening, Solna, Sweden
Filed Jul. 21, 1976, Ser. No. 707,256
Claims priority, application Sweden, Jul. 31, 1975, 7508686
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—163 **1 Claim**

1. A protective glove constructed of two overlying plastic films each having a thickness of 0.01 to 0.10 mm and both films having been deformed by embossing them simultaneously in overlying relationship so as to exhibit on one side a large number of embossed impressions each of which forms on the other side of the film a corresponding protuberance having a height of from 0.02 to 0.10 mm, said impressions and corresponding protuberances being substantially evenly distributed over the whole surface of the films and being spaced apart from 0.5 to 2 mm center-to-center, one of the films having its protuberances on the outside of the glove and the other film having its protuberances on the inside of the glove, and the

protuberances on one film being displaced relative to the protuberances on the other film so that the protuberances do not lie opposite each other when the glove lies flat.

4,084,266
ARTIFICIAL IMPLANT WITH FIBER-FLOCKED BLOOD-CONTACTING SURFACE
Victor L. Poirier, Chelmsford, and John T. Keiser, Acton, both of Mass., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.
Division of Ser. No. 602,385, Aug. 6, 1975, Pat. No. 4,016,303.
This application Nov. 1, 1976, Ser. No. 737,271
Int. Cl.[2] A61F *1/00, 1/24;* A61M *1/03*
U.S. Cl. 3—1 **2 Claims**

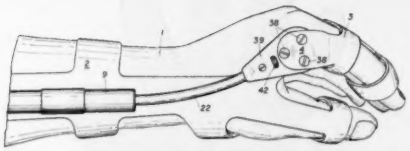
1. In an artificial implant device adapted to be implanted in blood-contacting position in the body of a living creature such as a human being, said device having its blood-contacting surface flocked with fibers of a blood-compatible polymeric material adhesively secured at their bases to said surface, the improvement wherein said fibers are interlocked with each other by means of bonds of adhesive material formed at the points of contact of said fibers with each other, thereby substantially reducing the possibility of fiber separation and release from said surface when said device is in implanted position, said fibers being substantially uncoated with said adhesive material except at their points of contact with each other and with said surface.

4,084,267

DRIVE FOR AN ORTHOSIS OR A PROSTHESIS

Alfred Zadina, Vienna, Austria, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria

Filed Sep. 20, 1976, Ser. No. 724,870
Claims priority, application Austria, Sep. 18, 1975, 7183/75
Int. Cl.[2] A61F 1/06, 1/00, 5/10
U.S. Cl. 3—1.1 14 Claims



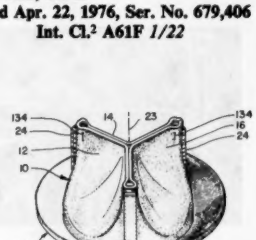
1. A limb rehabilitation device comprising a stationary part and a part movably mounted on the stationary part, a drive unit mounted on the stationary part and a transmission for converting a rotary motion produced by the drive unit into a reciprocating linear motion for driving the movably mounted part, the transmission including a transmission member coupled to the drive unit for rotation therewith, the transmission member having two separate threads of opposite pitch, two transmission elements respectively threadedly mounted on a respective one of the threads of opposite pitch for linear movement in relation thereto, the transmission elements being non-rotatable in relation to the transmission member whereby rotation of the member causes the linear movement of the elements, and a tackle with flexible elongated motion-transmitting means having two ends facing the drive unit, a respective one of the motion-transmitting means ends being affixed to a respective one of the transmission elements and the tackle being connected to the movably mounted part for moving the same in response to the rotary motion of the drive unit.

4,084,268

PROSTHETIC TISSUE HEART VALVE

Marian I. Ionescu, Leeds, England, and Bruce E. Fettel, Diamond Bar, Calif., assignors to Shiley Laboratories, Incorporated, Santa Ana, Calif.

Filed Apr. 22, 1976, Ser. No. 679,406
Int. Cl.[2] A61F 1/22
U.S. Cl. 3—1.5 14 Claims



4. A cloth covered stent for a prosthetic heart valve comprising:

a stent having an annular base and plural upright posts;

cloth fabric covering the interior surface of said stent;

cloth fabric covering the exterior surface of said stent;

a cylindrical tissue valve circumscribing said stent posts and said exterior cloth fabric;

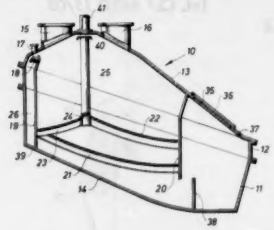
said interior fabric being tightly wrapped around the bottom edge of said stent covering the bottom edge of said exterior fabric, and preventing loose cloth at the bottom edge.

4,084,269

ARRANGEMENT FOR MOULDERING ORGANIC WASTE MATERIAL

Rikard Emanuel Lindström, Tonstigen 6, 135 00 Tyreso, Sweden

Filed Jun. 10, 1976, Ser. No. 694,699
Claims priority, application Sweden, Jun. 10, 1975, 7506661
Int. Cl.[2] A47K 11/02; C05F 3/04
U.S. Cl. 4—111 5 Claims



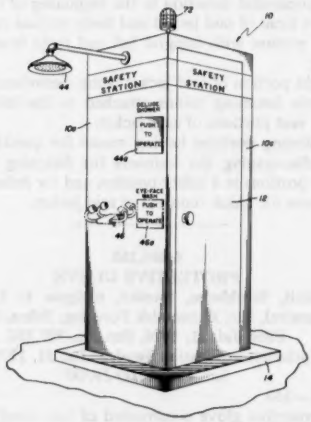
1. An arrangement for mouldering organic waste material in which liquids are supplied to a container separately from other waste, comprising a container having a waste supply opening located above an inclined surface provided at the bottom of the container along which waste material supplied to the container through said opening may slide under the action of gravity while undergoing a mouldering process, characterized by liquid conducting means arranged to conduct urine and other liquid, which is supplied to the container separated from other waste material, to a region within the container located adjacent to the highest portion of the inclined surface.

4,084,270

FREEZE PROOF EMERGENCY SHOWER UNIT

Samuel D. Kersten, Jr., Highland Park, Ill., assignor to Water Saver Faucet Co., Inc., Chicago, Ill.

Filed Jul. 6, 1976, Ser. No. 702,525
Int. Cl.[2] A47K 3/22, 3/00, 3/08
U.S. Cl. 4—145 6 Claims



1. A stationary freeze proof emergency shower unit capable of supplying a high volume of pretempered water at a desired temperature to an individual using the unit irrespective of the temperature of the ambient air surrounding the unit, comprising an insulated walled enclosure rigidly anchored in place at a preselected site, said enclosure having top, bottom and side walls, one of the side walls having a door permitting access to the interior of the enclosure, a deluge shower extending

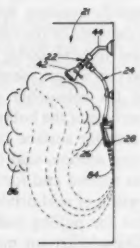
through and outwardly from a side wall of the enclosure and positioned at a height with relation to the bottom wall of the enclosure to enable a person standing under the deluge shower on the outside of the enclosure to stand in a substantially upright position, a tempered water storage tank within the enclosure connected to a source of water and to the deluge shower, water temperature control means within the enclosure associated with the tempered water storage tank for automatically maintaining the water in the storage tank at a preselected temperature irrespective of the temperature of the air on the outside of the enclosure, and deluge shower control means including valve means positioned within the enclosure between the storage tank and the deluge shower and valve control means operable from outside the enclosure for enabling a person to open the valve means within the enclosure to cause a high volume of tempered water at a preselected temperature to flow from the tempered water storage tank in the enclosure to the deluge shower on the outside of the enclosure.

4,084,271

STEAM BATH DEVICE FOR SHOWER

Irwin L. Ginsberg, 1236 Glenview St., Philadelphia, Pa. 19111

Filed Jan. 12, 1977, Ser. No. 758,747
Int. Cl.² A61H *33/06*
U.S. Cl. 4—161 **4 Claims**



1. Apparatus for use in a stall shower of a building to simulate a steam bath from hot water, comprising nozzle means, means mounting said nozzle means on a wall of said stall and means coupling said nozzle means to a pipe carrying the hot water supplied by said building, said nozzle means including an orifice for producing an aerosol mist of a multitude of fine droplets of hot water in a well defined flat spray pattern, and being constructed to have a low water flow rate to thereby produce a large volume of said fine water droplets from a small volume of water, said nozzle means being so mounted withrespect to said wall that the spray pattern is directed at an angle to the wall to impact the wall and produce a cloud of fine hot water droplets simulating live steam.

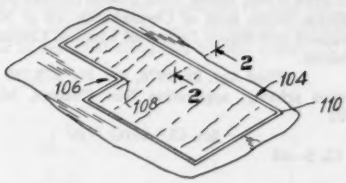
4. Apparatus for use in a stall shower of a building to simulate a live steam bath from hot water supplied by the building and carried in a pipe, said shower including a conventional shower head, said apparatus being connected by a diverter valve between said shower head and said pipe and comprising nozzle means, securement means for mounting said nozzle means on the wall of said stall, flexible hose means connected between said diverter valve and said nozzle means, and a protective shroud disposed over said nozzle means, said nozzle means including an orifice for producing an aerosol mist of a multitude of fine droplets of hot water in a well defined spray pattern, and being constructed to have a low water flow rate to thereby produce a large volume of said fine water droplets from a small volume of water, said nozzle being so mounted with respect to said wall that the spray pattern is directed at an angle to the wall to impact the wall and produce a cloud of fine hot water droplets simulating live steam.

4,084,272

SWIMMING POOLS WITH OVERFLOW GUTTERS

Merrill L. Laven, 4 Marion Ave., Albany, N.Y. 12203

Division of Ser. No. 428,882, Dec. 27, 1973, Pat. No. 3,938,199.
This application Jan. 22, 1976, Ser. No. 651,245
Int. Cl.² E04H *3/16, 3/18*
U.S. Cl. 4—172.17 **6 Claims**



1. For use with a swimming pool, an elongated plastic extrusion of channel-shaped configuration forming a gutter for receiving liquid which overflows from the pool, said gutter having an outer upper region, and concrete-retaining means connected with said outer upper region of said gutter and extending upwardly from said outer upper region of said gutter, said concrete-retaining means having at an elevation higher than said outer upper region of said gutter an outwardly directed hollow interior for receiving concrete, said concrete-retaining means being itself in the form of a plastic extrusion, the latter having a lower end provided with a pair of opposed inwardly directed flanges, and said outer upper region of the gutter having springy tongues for extending around and releasably holding said flanges connected to said gutter.

4,084,273

REVOLVABLE ROCKABLE PLAYPEN

Elwood W. Haynes, 6303 Pizzaro St., Duluth, Minn. 55807

Continuation of Ser. No. 589,474, Jun. 23, 1975, abandoned.
This application Jul. 15, 1976, Ser. No. 705,705
Int. Cl.² A47D *9/02, 9/04;* A63G *1/00*
U.S. Cl. 5—105 **1 Claim**

1. A revolvable rockable playpen comprising:

a. a hollow continuous frusto-conical body having the smaller diameter end positioned lowermost and an open upper end, and

b. a circular bottom secured to the other end,

c. a first flat annular flange formed on the lower edge of said hollow body extending outwardly therefrom and coextensive with said bottom,

d. a flat circular bottom member directly connected to and substantially coextensive with said annular flange,

e. said flat circular bottom member having a semi-spherical rocker portion formed directly on said circular bottom, the outer edge of which is spaced radially inwardly from the outer edge of said circular bottom,

f. means connecting said circular bottom to said annular flange, and

g. a second flat annular flange formed on the upper edge of said hollow body member extending outwardly therefrom

substantially at a right angle and of a diameter substantially equal to the diameter of said annular flange and said circular bottom member, and

h. spaced elongated flat supports extending between and connected to said first and second annular flanges.

4,084,274

TURNING BED

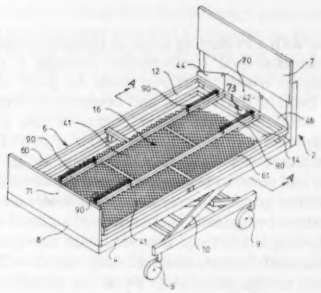
David John Willis, Lower Hutt; Dennis Clifford Stevenson, and William Bettle, both of Christchurch, all of New Zealand, assignors to Betstone Industries Limited, Christchurch, New Zealand

Filed Apr. 21, 1976, Ser. No. 678,769

Claims priority, application New Zealand, May 1, 1976, 117001

Int. Cl.² A61G *7/10*

U.S. Cl. 5—61 **18 Claims**



1. A tilting assembly for a bed comprising:

a longitudinally divided mattress frame including a centre section which is pivotally supportable from the frame of a bed, and an outer section adjacent each longitudinal side of said centre section, each said outer section being pivotally connected to the centre section;

wherein the pivotal connection between the centre section and each outer section comprises a plate secured across each end of each said section, the plane of each said plate being substantially perpendicular to the plane of said section, adjacent plates being arranged to butt against each other when the centre section is not titled, and a bracket extending across said adjacent plates, said bracket being pivotally secured to one of said plates and rigidly secured to the other of said plates, such that tilting the centre section to raise one longitudinal side thereof causes tilting of the outer section adjacent said longitudinal side of the centre section, the longitudinal side furthest from the centre section of said outer section being raised;

a lever secured at one end to the centre section, the other end of said lever being moveable so as to tilt the center section;

and means for moving said lever.

4,084,275

COVER FOR A LIFTING DEVICE AND METHOD OF UTILIZING SAME

Bengt Erland Ilon, Benzeholzstrasse 39, CH-6045 Meggen/Luzern, Switzerland

Division of Ser. No. 561,976, Mar. 25, 1975, Pat. No. 3,978,531. This application Aug. 5, 1976, Ser. No. 711,961

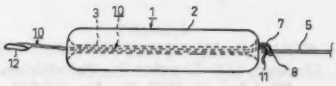
Claims priority, application Sweden, Apr. 1, 1974, 7443431

Int. Cl.² A61G *7/10*; A47B *83/04*

U.S. Cl. 5—81 R **10 Claims**

1. A disposable protective cover for a lifting device, said lifting device comprising a hollow member of thin, flexible material having ends and a recess extending entirely through the member from one end to the other, said recess being open at each end of the member, said member having an inner portion surrounding and defining said recess and an outer portion surrounding said inner portion and defining the exterior surface of said member, said inner and outer portions defining an enclosed chamber in said member, said chamber surrounding said recess and having a generally elongate, flattened, toroidal configuration, said inner and outer portions forming a continuous, uninterrupted surface, and means for driving said member in a rolling action, said driving means comprising an elongate driving member of greater length than the recess of said hollow member adapted to extend through said recess, said disposable cover comprising

an elongate tubular cover member having a body and first and second ends, said tubular cover member being made of flexible material of greater length than the length of said hollow member and being of such girth as to be adapted to surround said hollow member to cover said hollow member, said tubular cover member being constructed to fit within said recess of said hollow member, said first end of said tubular cover member being open, said tubular cover member being formed adjacent said first end for outwardly everting folding around the one end of the hollow member of the lifting device when part of the body of the tubular cover member is disposed within the recess of the hollow member, said first end also being constructed for releasable gripping engagement with the exterior surface of the hollow member to move in unison with said exterior surface as the hollow member moves in an everting motion, said tubular member being formed adjacent its second end for being releasably coupled to the end portion of said driving member extending through said recess for pulling said cover member into said recess by pulling said driving member into said recess, while enabling said cover member to be uncoupled from said driving member.



4,084,276

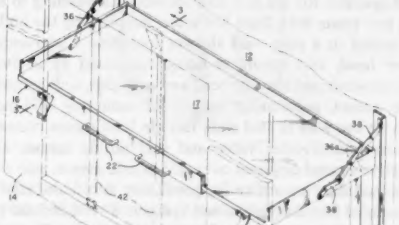
SWING-AWAY BUNK

Ray W. Trexler, Jr., Federal Way, and Donald J. Teodoro, Seattle, both of Wash., assignors to PACCAR Inc., Bellevue, Wash.

Filed Oct. 22, 1976, Ser. No. 735,090

Int. Cl.² A47K *11/02*

U.S. Cl. 5—118 **6 Claims**



1. A swing-away bunk for automotive truck cabs of the type

having a driving compartment and a sleeping compartment, comprising:

a sleeping compartment having a rear wall and forward vertical supports,

a bunk having a frame assembly and a mattress secured to said frame assembly,

said frame assembly including a forward frame member, a rearward frame member and a cam follower on the rearward frame member,

each of said rear wall and forward vertical supports having support brackets provided with horizontal ledges for supporting the forward and rearward frame members when the bunk is in a horizontal condition,

link means pivotally mounting the frame assembly to the rear wall,

handle means on the frame assembly forward frame member for pulling the bunk forwardly, and

cam means on the rear wall aligned with the cam follower, said cam means having forwardly and upwardly directed cam surfaces for guiding the frame assembly rearward frame member past said rear wall support brackets as the bunk is pulled sharply forward into the horizontal position.

4,084,277
COLLAPSIBLE GUARD RAIL

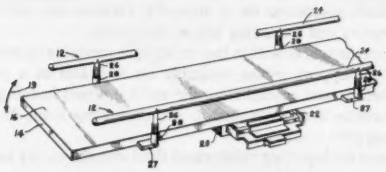
Raymond M. Conrad, 745 Woodruff Rd., Milford, Conn. 06460, and Charles R. Whitcomb, Rowley Rd., Woodbury, Conn. 06798

Division of Ser. No. 537,683, Dec. 30, 1974, Pat. No. 3,997,792. This application Sep. 27, 1976, Ser. No. 727,267

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.[2] A47D *7/02;* **A47C** *21/00*

U.S. Cl. 5—331 **10 Claims**



1. A collapsible guard rail assembly for a table or the like, said guard rail assembly comprising means for mounting said guard rail assembly on a table, a hollow elongated top rail, means for supporting said top rail on said mounting means for movement relative thereto between active and inactive positions, said top rail in its inactive position being supported generally adjacent said mounting means by said supporting means, said top rail in its active position being maintained in spaced relation to said mounting means by said supporting means, and means for releasably retaining said top rail in said active position, said supporting means, said retaining means and at least a portion of said mounting means being wholly disposed generally within the interior confines of said top rail when said top rail is in said inactive position.

4,084,278
HIGH SPEED TRANSFER

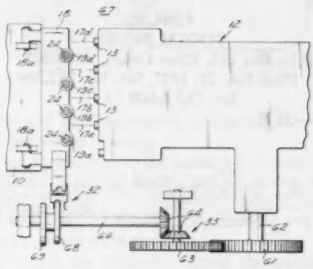
Gene E. Allebach, and Robert E. Wisebaker, both of Tiffin, Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Filed Aug. 2, 1976, Ser. No. 710,550

Int. Cl.[2] B21D *43/10, 53/24*

U.S. Cl. 10—76 T **19 Claims**

1. A transfer forging machine or the like comprising a frame, a slide reciprocable on said frame, tools and dies on said frame and slide cooperating to provide a plurality of die stations having working axes spaced from each other along a transfer plane extending in the direction of slide reciprocating movement, a transfer operable in timed relation to the movement of said slide for progressively transferring a workpiece from one die station to the subsequent die station; said transfer including a shaft pivoted for rotation about an axis midway between adjacent die stations and substantially perpendicular to said transfer plane, said shaft extending substantially to said transfer plane, a drive means for rotatably oscillating said shaft through substantially 180° between a pick-up position and a delivery position, and a gripper assembly supported on such shaft substantially at said transfer plane and extending substantially perpendicular to said shaft along said transfer plane, said gripper assembly including a support portion and gripper portion at the distal end thereof to grip a workpiece at one station when said shaft is in said pick-up position and to transport and deliver such workpiece to a subsequent die station when such shaft moves to said delivery position, said gripper and support portions each extending substantially exclusively in a direction away from the axis of said shaft, whereby said gripper and support portions are adapted to provide the sole offset from said shaft to either of said pick-up or delivery positions whereby said transfer is constructed to provide a relatively small eccentric mass to reduce eccentric loads and inertia forces developed during the operation of said transfer.



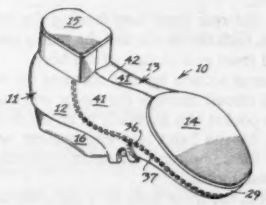
4,084,279
METHOD OF MAKING MUDGUARD STYLE SHOE

Newton C. Turner, Jr., Nashville, Tenn., assignor to Genesco, Inc., Nashville, Tenn.

Division of Ser. No. 620,873, Oct. 28, 1975, Pat. No. 4,001,955. This application Jan. 5, 1977, Ser. No. 756,957

Int. Cl.[2] A43D *9/00*

U.S. Cl. 12—142 R **10 Claims**



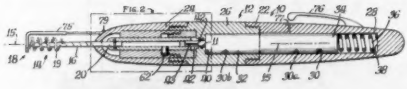
1. A method of making a shoe comprising the steps of:

a. forming an upper having a forepart, intermediate side portions, a heel portion, said forepart and said intermediate side portions having lower marginal edge portions,

b. forming a mudguard piece substantially coextensive with the forepart and the intermediate side portions of said upper and having an upper edge portion, a forepart bottom edge, and opposed intermediate side portions depending below said forepart bottom edges a predetermined amount and terminating in mating intermediate bottom edges,

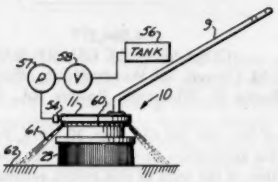
c. securing the upper edge portion of said mudguard piece to the lower marginal edge portions of the forepart and the intermediate side portions of said upper.
d. securing said intermediate bottom edges together in mating relationship,
e. inserting at least one insole member having a bottom face within the forepart of said upper, within said heel portion and within said secured intermediate side portions of said mudguard piece,
f. securing said forepart marginal edges to said insole member, and
g. securing an outsole to the bottom face of said insole member.

4,084,280
TOOTH BRUSH
Bob May, P.O. Box 212, River Forest, Ill. 60305
Filed Feb. 25, 1977, Ser. No. 772,304
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—22 R 1 Claim



1. A tooth brush of the character disclosed, comprising,
a barrel having a rear end and a front end and made up of three sections, a middle section, a front section and a rear section, the sections being normally connected together for use of the device, but being separable,
the middle section and the rear section having bore portions which are axially algined when those sections are fitted together, and which form a rear main bore,
the middle section and the front section having bore portions which are aligned when those sections are fitted together and which form a front main bore,
the middle section having a reduced bore interconnecting the rear main bore and front main bore, and the middle section having a rearwardly facing annular shoulder surrounding the reduced bore and forming the front end surface of the rear main bore and also having a forwardly facing annular shoulder surrounding the reduced bore and forming the rear end surface of the front main bore,
the front section having an aperture at its front end leading from the front main bore to the exterior,
a motor in the rear main bore having a drive shaft extending through the reduced bore into the front main bore,
a battery in the rear main bore in operative engagement with the motor,
a spring in the rear main bore biasing the battery into engagement with the motor and the motor into engagement with said front end surface of the bore,
the rear barrel section having contacts for establishing an electrical circuit through the motor and battery, and also having a pocket clip normally in an inactive position, but movable by the hand into engagement with the motor contacts for completing an electrical circuit through the battery and motor,
a drive unit in the front main bore including an outer sleeve made up of relatively longitudinally positioned sections normally fitted together in the assembled device, and the sleeve being confined in the front main bore between said front annular shoulder and a surface of the front section adjacent the front end of the latter,
the sections of the outer sleeve having interfacing end surfaces spaced apart when they are assembled and defining therebetween an annular cam track disposed at an acute angle to the main longitudinal axis of the device,
the drive unit also including an inner sleeve rotationally and reciprocally disposed in the outer sleeve and having an element at its rear end in drive transmitting connection with the shaft of the motor, said inner sleeve having a radial pin extending into said cam track,
the tooth brush also including a brush member having a brush element on the exterior of the barrel an a shank extending through the front end aperture of the barrel into the front end of the inner sleeve of the drive unit, and normally frictionally held in and carried by that inner sleeve, but detachable therefrom through the front end of the barrel,
the inner sleeve, in response to rotation by said motor, following a reciprocatory movement by the interconnection between said pin and cam track for reciprocating the sleeve and thereby reciprocating the brush member.

4,084,281
FLUID-POWERED ROTARY BRUSH
Eugene David Smith, 3100 Hollins, Bakersfield, Calif. 93305
Filed Jul. 16, 1976, Ser. No. 705,950
Int. Cl.[2] A46B *13/06*
U.S. Cl. 15—29 3 Claims



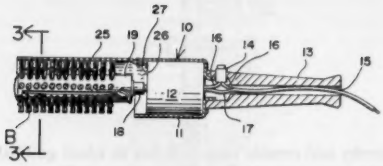
1. A fluid-powered rotary brush comprising:
a housing having a cavity;
a shaft positioned on a normally vertical axis within the cavity and extending below the cavity;
a turbine wheel within the cavity and rotatable on said axis;
brush support means rotatable on said axis at a position below, and spaced from the turbine wheel housing;
a circular brush attached to and depending from the brush support means;
means for injecting pressurized fluid into the cavity to rotate the turbine wheel;
means interconnecting the turbine wheel and the brush support means to produce rotation of the brush support means when the turbine wheel rotates; and
fluid outlet means through the housing positioned with axes of fluid flow directed downwardly and outwardly relative to the housing and clearing the periphery of the brush so as to spray fluid from the cavity over and beyond, and not contacting, the periphery of the brush; said turbine wheel having a plurality of peripheral bores spaced from each other, each bore being slanted with a component of direction radially inward and another component of direction tangential in the direction which the wheel will turn, and said fluid injecting means being directed to inject fluid into each bore successively as the wheel turns, thereby torquing the wheel, a wall surface of the turbine wheel being provided with a plurality of spaced grooves extending in a generally radial direction from the periphery of the wheel toward the axis of the wheel, and a plurality of holes through the housing wall adjacent the grooves, through which atmospheric air is aspirated into the cavity while fluid is flowing through the cavity from the fluid injecting means to the fluid outlet means;
whereby the sending of pressurized fluid through the fluid injection means into the cavity produces rotation of the turbine wheel and of the brush and causes fluid to spray from the cavity through the opening means onto a surface being brushed beyond the periphery of the rotating brush.

4,084,282

ROTARY BRUSH FOR REMOVING HAIR FROM HAIR BRUSHES

Madeleine M. Calvert, 17861 NE. 13th Ave., North Miami Beach, Fla. 33162

Filed Jun. 27, 1977, Ser. No. 810,414
Int. Cl.[2] A46B *17/06, 15/00*
U.S. Cl. 15—38 3 Claims



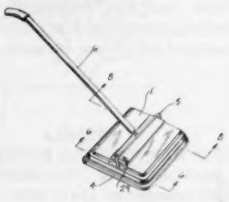
1. A rotary hair removing brush for removing hair entangled in conventional hair brushes having a motor, a substantially cylindrical bristle holding member connected to said motor, a slotted portion mounted on said cylindrical member along substantially the full length thereof and hair cutting means slidably mounted in said slotted portion for cutting hair wound about said cylindrical member.

4,084,283

FLOOR SWEEPER

Henry J. Rosendall, Grand Rapids, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.

Filed Dec. 17, 1976, Ser. No. 751,724
Int. Cl.[2] A47L *11/33*
U.S. Cl. 15—48 18 Claims



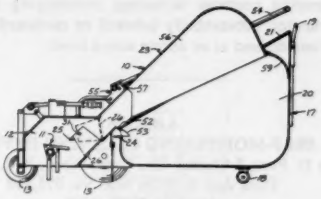
1. In a floor sweeper:
a. a housing,
b. a brush mounted on a fixed axis within said housing for delivering dust to a dust-receiving area upon reciprocal translation of the sweeper over a floor,
c. said brush being disposed to contact and freely rotate on the floor in a direction to deliver dust to the dust-receiving area upon translation of the sweeper in one direction,
d. a coupling wheel on said brush,
e. and means to positively drive said brush through said coupling wheel and in the same direction as its aforementioned free rotation upon translation of the sweeper in the opposite direction, said drive means comprising:
1. a unitary assembly disposed within said housing adjacent said brush and with said assembly including a sweeper supporting wheel and a dust pan defining said dust-receiving area,
2. and means mounting said assembly and housing for relative horizontal longitudinal movement therebetween so that translation of said sweeper in one direction causes said relative movement to thereby mutually engage said first and second-named wheels to drive said brush, and so that translation of said sweeper in the opposite direction causes said relative movement to thereby mutually disengage said first and second-named wheels to release said brush from the drive.

4,084,284

LAWN AND YARD IMPLEMENT

Paul F. Hastings, c/o Yard Marvel Mfg. Co., N. 5509 Market St., Spokane, Wash. 99207

Filed Aug. 20, 1976, Ser. No. 716,132
Int. Cl.[2] E01H *1/04*
U.S. Cl. 15—79 A 11 Claims



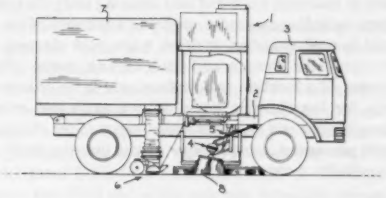
1. A lawn and yard implement, comprising:
a wheel supported housing;
ground working means on the housing for forcibly removing trash from the ground surface and projecting it outwardly from the housing;
a wheel supported pushcart having an open trash receiving bin and a pushbar mounted thereto;
latching means for releasably fixing the pushcart to the housing;
chute means for guiding the projected trash from the housing into the pushcart bin; and
deflector means associated with the latching means for blocking passage of the trash from the housing when the pushcart is detached therefrom.

4,084,285

STREET SWEEPER WITH MULTI-POSITION GUTTER BRUSH

Fritz W. Herzog, Cedarburg, Wis., assignor to Central Engineering Co., Inc., Milwaukee, Wis.

Filed Apr. 18, 1977, Ser. No. 788,142
Int. Cl.[2] E01H *1/04*
U.S. Cl. 15—87 12 Claims



1. In a vehicular street sweeper;
a. a frame,
b. a gutter brush rotatable on a first generally vertical axis for sweeping debris from the street,
c. linkage means mounted at its forward end for rotation about a second vertical axis and extending rearwardly to a connection with said brush, said linkage means and brush being pivotable together in a vertical direction,
d. connector means mounted at its forward end to said frame and forwardly of said linkage means, with said connector means extending rearwardly to a connection with said brush,
e. said connector means defining a longitudinal axis, the length of which corresponds to the radius of horizontal swing component of said brush, and with said longitudinal axis extending generally parallel to said linkage means,
f. motive means connected between said frame and said linkage means for causing said brush to swing com-

poundly with said linkage means and said connector means from a retracted position inboard of the vehicle perimeter and out of engagement with the street to an operating position,

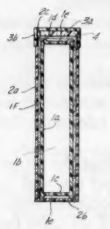
g. and means for selectively adjusting the length of said radius of horizontal swing component of said brush so that said brush is movable by said motive means to selected operating positions including: overlapping said vehicle perimeter, substantially inboard or outboard of the said perimeter, and at or above street level.

4,084,286

SELF-MOISTENING CLEANING DEVICE

Herman D. Post, 7 Chester Dr., Great Neck, N.Y. 11021

Filed Apr. 8, 1976, Ser. No. 675,190
Int. Cl.[2] B08B *9/00*
U.S. Cl. 15—104.93 **9 Claims**



1. A self-moistening cleaning device, particularly for cleaning phonograph records and similar objects, comprising, in combination, a receptacle having a chamber; means for closing said chamber; a cleaning body normally accommodated in said chamber and exposable to ambient atmosphere when it is desired to use said cleaning body to clean an object, said cleaning body having an outer circumferential surface and a layer of moisture-accepting material provided on and covering at least said outer circumferential surface; and means for controlledly moistening said layer of said cleaning body with a cleaning liquid in readiness for use of said cleaning body for cleaning an object, including means for confining a quantity of the cleaning liquid in said chamber, at least when said cleaning body is accommodated therein and said closing means closes said chamber, at a location remote from said layer of said cleaning body, for the cleaning liquid to evaporate and saturate the atmosphere in said chamber with a vapor of the cleaning liquid which penetrates into said layer of said cleaning body and thus controlledly moistens the same.

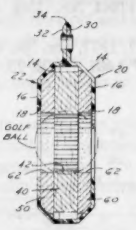
4,084,287

SCRUBBER FOR GOLF BALLS

Arlen E. Ingram, and Norman H. Ingram, both of 12843 Artesian, Detroit, Mich. 48223

Filed May 28, 1976, Ser. No. 691,133
Claims priority, application Japan, Jun. 24, 1975, 50-95227[U]
Int. Cl.[2] A63B *57/00*
U.S. Cl. 15—210 R **3 Claims**

1. In a washer device for golf balls which includes a hollow toroidal housing to contain water and soap retaining material and having a central hole on each side slightly larger than the diameter of a golf ball, that improvement which comprises a laminate filler for said housing composed of a first inner ring of sponge-like material for retaining water and a cleaning substance, and an outside ring on each side and laterally adjacent said inner ring substantially concentric with said inner ring, said outside rings having a central hole slightly smaller than the diameter of a golf ball and being formed of material which is flexible but which does not soften in the presence of water,



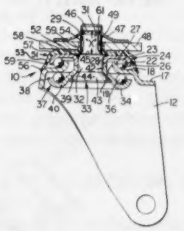
whereby said outside rings will flex to admit golf balls into said washer device but will retain a ball until released under pressure.

4,084,288

SHOCK ABSORBER FOR SWIVEL CASTER

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Jan. 12, 1977, Ser. No. 758,775
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—21 **10 Claims**



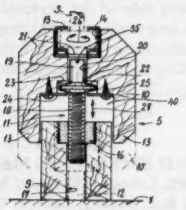
1. In a device for use with a bearing construction for a caster mountable on a caster mounting plate including a yoke and securing means for securing said yoke to said caster mounting plate, wherein said securing means includes pin means rigidly secured to and coaxial with said bearing construction, the axes of said pin means and said bearing construction extending in a normal position perpendicular to said caster mounting plate through an opening therein, the improvement comprising first means for facilitating a tilting of said axes relative to said mounting plate, an elastomeric member mounted between said bearing construction and said caster mounting plate, said elastomeric member having a compressible characteristic sufficient to maintain said caster firmly connected to said mounting plate to maintain said axes in said normal position while simultaneously being capable of yielding to a sufficiently large force applied to said yoke to permit a relative movement between said mounting plate and said yoke to thereby prevent permanent deformation to said yoke when an abnormally high force is applied thereto and wherein said securing means includes second means for limiting the initial preload of said elastomeric member between said bearing construction and said mounting plate to maintain said axes in said normal position while simultaneously facilitating a relative tilting movement of said axes relative to said mounting plate, said elastomeric member effecting a return of said axes to said normal position.

4,084,289

GUIDE RAIL FOR SLIDING PANELS, DOORS AND THE LIKE

Jean-Pierre Naimo, Rillieux-la-Pape, France, assignor to A.T.M.B. Societe Anonyme, Puteaux, France

Filed Jan. 12, 1977, Ser. No. 758,788
Claims priority, application France, Jan. 14, 1976, 76 01485
Int. Cl.[2] A47H *1/04, 15/00*
U.S. Cl. 16—96 R 12 Claims



1. A rail for the guidance of a sliding structural component, comprising:

an elongate base member fixedly securable to a support;

an elongate track member extending substantially parallel to said base member with an intervening longitudinal clearance and with a longitudinally extending guide channel parallel to said clearance slidingly engageable with said component; and

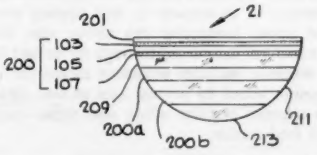
a plurality of adjustable connectors joining said members to each other at longitudinally spaced locations, each connector including a male threaded element and a female threaded element matingly engaging each other, one of said threaded elements being nonrotatably anchored to said base member, the other of said threaded elements being rotatably anchored to said track member for enabling limited changes in the separation and relative orientation of said members at any of said locations.

4,084,290

SLIDING DOOR AND WINDOW STOP

Wasyl Lymar, 607 Williams St., Broderick, Calif. 95605, and Alice Jean Manley, 1710 V St., Sacramento, Calif. 95818

Filed Feb. 25, 1977, Ser. No. 772,247
Int. Cl.[2] A47H *1/04, 15/00*
U.S. Cl. 16—96 R 16 Claims



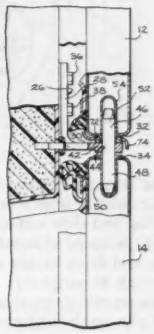
1. A sliding door or window removal prevention device which comprises a plurality of layers, in superposed relationship upon a body portion comprises a segmented body consisting of a plurality of alternating superposed layers of body material, and adhesive, terminating in a body material layer, which has a flat top surface, the uppermost being release layer, followed by an adhesive structure, said adhesive structure being disposed upon said surface, wherein the device is dimensioned vertically to fit above the door or window and does not interfere with the lateral movement of said door or window, when inserted into operative position on the underside of the top track.

4,084,291

CENTER HINGE FOR TOP-MOUNT, TWO-DOOR REFRIGERATOR

William P. Crowe, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 2, 1976, Ser. No. 747,047
Int. Cl.[2] E05D *7/02, 15/50*
U.S. Cl. 16—170 2 Claims



1. An arrangement for reversibly mounting upper and lower vertically aligned doors on a refrigerator cabinet, comprising:

upper pivot means removably mountable on said cabinet substantially adjacent either the right- or left-hand side thereof, said upper pivot means adapted to cooperatively engage the top edge of the upper door adjacent either side thereof;

lower pivot means removably mountable on said cabinet substantially adjacent either the right- or left-hand side thereof in vertical alignment with said upper pivot means, said lower pivot means adapted to cooperatively engage the bottom edge of the lower door adjacent either side thereof;

a non-symmetrical hinge pin bracket mountable generally between the upper and lower doors adjacent either the right-or left-hand side of the cabinet,

said non-symmetrical bracket having a vertical mounting strap for attachment to the front face of the cabinet by means of a mounting screw, and having a horizontal support portion joined to one end of said mounting strap, with an elongated horizontal side arm joined to the support portion, the distal end of the side arm extending inwardly and connectable to the horizontally-extending front frame of the cabinet to stabilize said bracket,

whereby, when said bracket is mounted generally adjacent one side of the cabinet, the mounting strap is directed upwardly and extends above the upper edge of the lower door, and, when said bracket is mounted generally adjacent the other side of the cabinet, the mounting strap is directed downwardly and extends below the upper edge of the lower door, the lower door blocking access to the mounting screw;

said support portion including a pivot hole in vertical alignment with the corresponding upper and lower pivot means; and

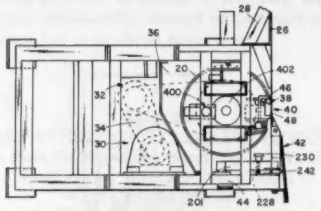
a double hinge pin loosely received in the pivot hole with the lower portion of the double hinge pin telescoped into a mating sleeve in the top edge of the lower door, and the upper portion of the hinge pin telescoped into a mating sleeve in the bottom edge of the upper door.

4,084,292

DRUM SKINNER

Martin L. Harlan; John A. Krause, both of Grand Rapids, and Ronald L. Brooks, Lowell, all of Mich., assignors to Wolverine World Wide, Inc., Rockford, Mich.

Filed Oct. 29, 1976, Ser. No. 736,710
Int. Cl.[2] A22C *17/12*
U.S. Cl. 17—50 62 Claims



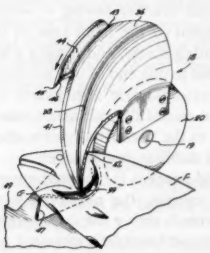
1. Hog carcass skinning apparatus for removing the skin with retained hair directly from a hog carcass, comprising:
a carcass-abutting and slide surface;
a drum rotatably mounted adjacent said carcass-abutting and slide surface, said drum having an axially orientated ditch opening through its periphery;
clamping means on said drum at said ditch for clamping an edge flap of skin on the hog carcass;
a skin scraper positioned adjacent said ditch;
extensible-retractable skin flap gripping and infeeding means in said ditch extensible out of said ditch and retractable into said ditch for gripping and infeeding the edge flap into said ditch to allow clamping thereof whereby upon an edge flap of skin being gripped and pulled into said ditch and clamped, rotation of said drum through a revolution causes the carcass to rotate on said abutting and slide surface and the skin to be scraped off the carcass by said scraper.

4,084,293

FISH-BEHEADING MACHINE AND PROCESS

Elmer R. Hogan, Bellevue; Charles Edward Hollis, and John I. Simpson, both of Seattle, all of Wash., assignors to Smith-Berger Manufacturing Corporation, Seattle, Wash.

Filed Apr. 15, 1976, Ser. No. 677,157
Int. Cl.[2] A22C *25/14*
U.S. Cl. 17—52 3 Claims



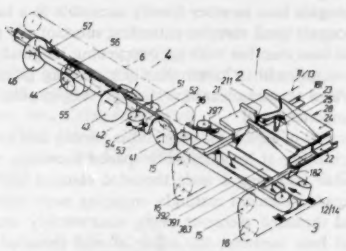
1. In a fish-beheading machine including fish-supporting means, a fish-beheading knife and means for effecting relative movement of the fish-supporting means and the knife to effect a relative chopping movement of the knife and the fish to behead the fish, the improvement comprising the knife being of one-piece plate structure having a single blunt tip portion formed integral with and disposed in continuation of a cutting portion, said cutting portion having opposite convex and concave sides, said convex side being contoured to correspond approximately to the profile of the headward side of the pectoral girdle of a fish supported by the fish-supporting means and said cutting portion of the fish-beheading knife having opposite edges sharpened over the major portion of the knife length and width and converging toward said single blunt tip portion located generally centrally of the knife width for punching engagement of said tip portion with the gill cover of the fish, said converging edges of the knife cutting portion being sharpened by being chamfered only on the convex side of the knife cutting portion, which chamfered edges merge adjacent to said blunt tip portion and provide said tip portion with oppositely-sloping sides meeting in a crest engageable with the headward side of the pectoral girdle of the fish for locating the fish lengthwise and guiding head-severing movement of the knife cutting portion following the same path traversed by said tip portion precisely along the headward side of the pectoral girdle.

4,084,294

FISH PROCESSING MACHINE

Franz Dohrendorf, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany

Filed Aug. 13, 1976, Ser. No. 714,337
Int. Cl.[2] A22C *25/08, 25/12*
U.S. Cl. 17—57 9 Claims



1. Fish processing machine having an endless loading conveyor including a horizontal upper run and a horizontal lower run and adapted to convey fish along said horizontal upper run with said fish lying on their sides in fish troughs transversely to their longitudinal axis, a feed section having opposed walls forming a V-shape and adapted to advance the fish in the direction of their longitudinal axis and substantially perpendicular to the direction of feed of the upper run of said loading conveyor, and a filleting section provided with belly filleting knives, rib knives and a pair of endless conveyors, wherein the feed section is positioned between the upper and lower runs of the loading conveyor, each fish trough has a tipping trough pivotally mounted on said endless loading conveyor for tilting movement thereon about a pivotal axis substantially transverse to its direction of movement as said tipping trough moves along said upper horizontal run above said feed section, whereby to deliver fish turned through 90° to said feed section, and said machine includes actuating means for tilting each tipping trough about its pivotal axis as said tipping trough reaches a selected position along said upper horizontal run above said feed section.

4,084,295

BUTTON

Hidenosuke Ishizaki, 6-13, 6-chome, Kobe-shi, Japan

Filed Jun. 29, 1977, Ser. No. 811,317
Int. Cl.[2] A44B *1/42*
U.S. Cl. 24—95 5 Claims

1. A button comprising:
a button face member,
a support plate having a center hole for supporting the face member,
a hollow button shank having upper and lower open ends, a constricted neck at its upper portion and a shoulder extending downward from the constricted neck, the neck

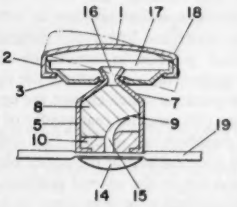
having a smaller diameter than the center hole, the shoulder having a larger diameter than the center hole,

a bending guide member disposed within the shank and having a slanting surface at its bottom for bending and guiding,

an engaging member having a center bore extending therethrough and disposed within the shank and under the bending guide member, and

a fastening member having a piercing needle,

the support plate being loosely fitted around the neck of the



shank and retained thereon by an enlarged top portion formed at the upper end of the neck after the support plate has been loosely fitted around the neck,

the button face member being fitted over the support plate to form a button head from the face member and the support plate, the button head being pivotably turnably supported by the shank with the enlarged top portion of the shank positioned within the space defined by the face member and the support plate,

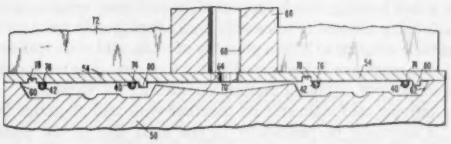
the shank being fastenable to a fabric or like sheet-like material by the piercing needle of the fastening member.

4,084,296

METHOD OF MANUFACTURE OF ORIENTED SLIDE FASTENING ELEMENT

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Aug. 4, 1975, Ser. No. 601,787
Int. Cl.[2] B29D *5/00*
U.S. Cl. 24—205.13 12 Claims



1. An interlocking element for a slide fastener comprising

a molded elongated body of synthetic polymer resin including a head portion and a pair of leg portions extending from opposite sides of the head portion;

said body being formed by substantially laminar flow of flowable synthetic polymer resin in a mold cavity sequentially along one of the pair of leg portions, the head portion, and the other of the pair of the leg portions, and then hardening the synthetic polymer resin in the cavity; and

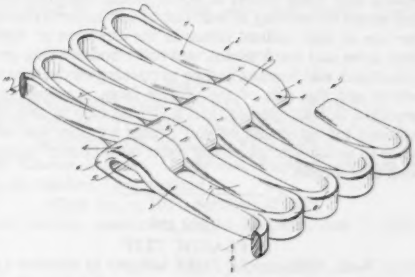
said flowable synthetic polymer resin including long chain molecules which are oriented along the direction of laminar flow.

4,084,297

SLIDE FASTENER

Alfons Frohlich, and Franz Hochlehnert, both of Essen, Germany, assignors to OPTI Patent- Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,047
Claims priority, application Germany, Sep. 10, 1975, 2540272; May 18, 1976, 2622070
Int. Cl.[2] A44B *19/12*
U.S. Cl. 24—205.13 C 8 Claims



1. In a slide fastener having a pair of rows of interdigitatable coupling elements formed from respective continuous synthetic-resin monofilaments, each of said coupling elements comprising a loop-forming coupling eye provided with a head, a pair of shanks extending away from said eye and respective bights connecting the shanks to the shanks of adjacent coupling elements, the improvement wherein:

(a) the monofilament forming each of said rows is of generally ellipsoidal cross-section with major and minor axes;

(b) the major axis of the cross-section of the monofilament in the region of each of said eyes lies generally parallel to the slide fastener plane;

(c) the minor axis of the cross-section in the region of the bights lies generally parallel to the slide fastener plane; and

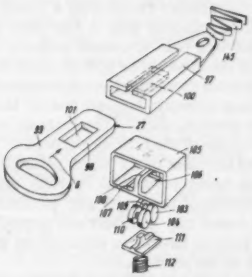
(d) at least one transition twist is provided along each shank between the respective head and bight.

4,084,298

CLOSURE FOR SAFETY BELTS

Artur Fohl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Continuation-in-part of Ser. No. 480,029, Jun. 17, 1974, Pat. No. 3,935,618. This application Dec. 1, 1975, Ser. No. 636,541
Claims priority, application Germany, Jun. 20, 1973, 7322931[U]
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—230 AL 6 Claims



1. A releasable latch especially for passenger seat belts, comprising: a housing having a slot, a member having a tongue

with a plane in a length defined thereby and with a flat side of the tongue insertable into the slot in the housing, notch means in the tongue substantially perpendicular to the plane of the tongue, roller bodies having axes in the housing engageable with said notch means when the tongue is inserted into said slot to latch the said housing and the said member together, said roller bodies having the axes thereof extending laterally to the length of the tongue and disposed for rolling engagement of the roller bodies with the tongue upon insertion of the tongue into the slot, said roller bodies rollingly engaging one another and lying in the path of said notch means, resilient means biasing said roller bodies in notch means engaging direction, and means for moving at least one of said roller bodies against the bias of said resilient means in the direction of disengagement from said notch means, said roller bodies being generally cylindrical, said housing having an opening on one side toward which said flat side of the tongue faces, a release member arranged in said opening, and a release cam in said housing actuated by movement of said release member and operable when so actuated to move said roller bodies out of engagement with said tongue.

4,084,299

PLASTIC CLIP

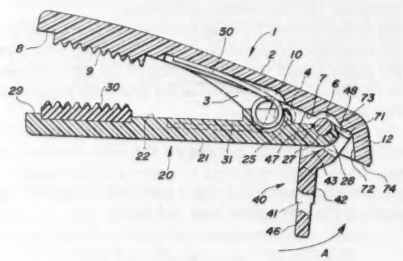
Taizo Noda, Nishinomiya, Japan, assignor to Kohshoh Limited, Kyoto, Japan

Filed Mar. 10, 1977, Ser. No. 776,134

Claims priority, application Japan, Nov. 26, 1976, 51-158846[U]

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—250 **13 Claims**



1. A plastic clip comprising:

(a) an upper clip member comprising an upper plate portion having a front clipping end, a rear end, a pair of elongated sides extending between the front and rear ends, a pair of support portions extending downwardly from the sides of the upper plate portion adjacent the rear end thereof, each of the support portions having a bearing portion, the upper plate member having a slide surface positioned laterally inside of the support portions and rearwardly of the bearing portions,

(b) a lower clip member comprising a lower plate portion having a front clipping end, a rear end, and a pair of elongated sides, a pair of journal supports extending upwardly from the lower plate portion adjacent the rear end thereof, a journal extending laterally outwardly from each of the journal supports beyond one of the sides of the lower plate portion, each of the journals being rotatably positioned in one of the bearing portions of the upper clip member and the sides of the lower plate portion adjacent the journals being positioned laterally inwardly of the support portions of the upper clip member whereby the upper and lower clip members are pivotally connected, the lower portion having an engagement groove therein rearwardly of the journals,

(c) a resilient member positioned between the upper and lower clip members for resiliently urging the clipping ends thereof to pivot away from each other, and

(d) an operative member having a rear attachment plate portion, a pair of spaced-apart side walls extending forwardly from the attachment plate portion, and a pivotal shaft extending between the side walls, the pivotal shaft of the operative member being rotatably positioned in the engagement groove of the lower clip member and the rear end of the lower clip member being positioned laterally inwardly of the side walls of the operative member, the side walls of the operative member being positioned laterally inwardly of the support portions of the upper clip member whereby the operative member is pivotally mounted on the lower clip member, the operative member, upper clip member, and lower clip member being movable between a first position in which the clipping ends of the upper and lower clip members are separated and a second position in which the clipping ends are brought together, the side walls of the operative member having arm portions which engage the upper plate portion of the upper clip member rearwardly of the slide surface when the members are in their first position and which engage the slide surface of the upper plate portion when the members are in the second position, pivoting movement of the operative member from its first position to its second position causing the upper clip member to pivot from its first position to its second position against the urging of the resilient member.

4,084,300

AUTOMATIC TOOL CHANGING METHOD AND APPARATUS

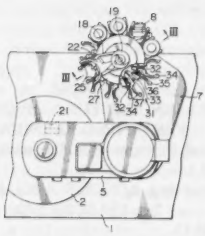
Hiroshi Narushima, Nagoya, and Takayosi Hotta, Gifu, both of Japan, assignors to Okuma Machinery Works, Ltd., Nagoya, Japan

Filed Sep. 9, 1976, Ser. No. 721,697

Claims priority, application Japan, May 8, 1976, 51-52609

Int. Cl.[2] B23Q *3/157*

U.S. Cl. 29—26 A **7 Claims**



1. In a machine tool having an axially extending main spindle, a tool holding chuck supported by said main spindle, said chuck being adapted to releasably hold a tool therein and a tool magazine adapted to hold a plurality of tools, said main spindle and said magazine being movable to a tool changing region an automatic tool changing method comprising the steps of:

a. moving said main spindle together with said magazine in a direction perpendicular to the axial line of the main spindle and in response to said movement to loosen a chuck of the main spindle in said tool changing region;

b. elevating said main spindle in the axial direction thereof so as to draw an old tool out of said loosened chuck;

c. turning further said main spindle together with said magazine and in response to said further turning movement to rotate said magazine for indexing a new tool for receipt into said chuck;

d. lowering said main spindle in the axial direction thereof so as to insert said new tool into said loosened chuck; and

e. turning said main spindle together with said magazine in a direction perpendicular to the axial direction of said main spindle and in response to said turning movement to fasten

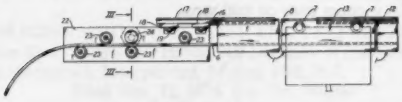
said chuck into gripping engagement with said new tool inserted thereinto.

4,084,301

TROLLEY RAIL ASSEMBLY

Donald R. Ross, Pittsburgh, Pa., assignor to U-S Safety Trolley Corporation, Pittsburgh, Pa.

Filed May 19, 1977, Ser. No. 798,302
Int. Cl.[2] B23P *23/04*
U.S. Cl. 29—33 K 5 Claims



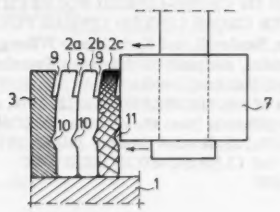
1. In combination with a line of rails disposed end to end and having a front side provided with parallel slots extending lengthwise thereof for receiving electric current pick-up members movable lengthwise of the rails, apparatus for feeding metal bars from a coil lengthwise into said slots to form continuous straight electrical conductors in said rails, said apparatus comprising supporting means attached to one end of said line of rails and extending away from it, a roll support, means rigidly connecting the roll support to said supporting means at said end of said line, and a plurality of staggered straightening rolls rotatably mounted in said roll support to form a roll pass substantially in line with one of said slots, whereby a conductor bar fed through said roll pass will be straightened therein and directed into said one slot.

4,084,302

METHOD OF MANUFACTURING, FOR A PAPER MACHINE OR THE LIKE, A ROLL HAVING A GROOVED EXTERIOR SURFACE

Eino Aatinen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Oct. 6, 1975, Ser. No. 620,229
Claims priority, application Finland, Oct. 9, 1974, 2944/74
Int. Cl.[2] B21K *1/02*
U.S. Cl. 29—148.4 D 8 Claims



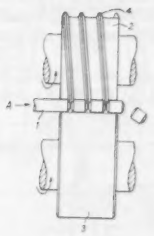
1. In a method of manufacturing, for a paper machine or the like, a roll having a grooved exterior surface, the steps of winding onto an exterior cylindrical surface of an inner roll body an elongated strip which initially is straight and which curves while being wound onto the inner roll body with an inner edge region of the strip engaging the exterior surface of the roll body while an outer edge region of the strip is distant from the roll body and has a thickness less than the thickness of the remainder of the strip so that when the turns of the strip engage each other after winding of the strip onto the inner roll body, a helical groove will be defined between the successive turns of the strip at the outer edge region thereof, and elongating the strip simultaneously with the winding thereof onto the inner roll body at a longitudinal portion of the strip which is spaced outwardly from the exterior surface of the inner roll body which is engaged by the inner region of the strip, for facilitating the curving of the strip while it is wound onto the inner roll body, the elongation of said longitudinal portion of said strip being brought about by pressing the strip at an outer exposed side surface region thereof simultaneously with the winding of the strip onto the inner roll body toward the turns of the strip which have previously been wound onto the inner roll body, with said outer side surface region which is thus pressed being spaced from the exterior surface of the inner roll body and with the pressing being carried out with a force which is sufficient to compress the strip against the previously formed turns thereof while deforming and elongating the strip at said longitudinal portion thereof, said longitudinal portion of the strip being in line with said outer side surface region thereof.

4,084,303

FORMING ROLL FOR ROLLING CYLINDRICAL BODIES FROM CYLINDRICAL ROD STOCK, AND A METHOD OF MAKING THE SAME

Kenneth Charles Skinner, Longlevens, England, assignor to Helipebs Limited, Ore, England

Filed Jan. 6, 1977, Ser. No. 757,322
Claims priority, application United Kingdom, Jan. 7, 1976, 571/76
Int. Cl.[2] B21H *8/02*
U.S. Cl. 29—148.4 D 4 Claims



1. A forming roll for forming cylindrical metal slugs from cylindrical rod stock, comprising a helical groove having a cylindrical base portion of constant radius and substantially constant axial length, said groove being defined by a helical rib of progressively increasing height for parting said rod stock into slugs, said helical rib having leading and trailing flanks of which the pitch is changed progressively along the axial length of the roll in stages including a first stage occupying an arc of not more than 360° wherein the pitch of the trailing flank of the rib is smaller than the pitch of the remainder of said trailing flank, and a second stage wherein the pitch of the leading flank has a smaller pitch than that of the trailing flank whereby the axial length of the helical rib is increased along the axis of the roll, and wherein the said pitch of the trailing flank in the first stage and the said pitch of the leading flank in the second stage are approximately the same and the respective portions of said flanks are axially opposed to one another, whereby the increase in axial length of the said rib is accommodated substantially without reduction in the axial length of the helical groove.

4,084,304

METHOD OF CONSTRUCTING A VALVE

Bruce B. Myers, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

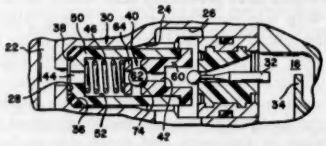
Filed Apr. 5, 1977, Ser. No. 784,763
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—157.1 R 3 Claims

1. A method of constructing a valve having a valve member retained within a casing by means of a plug cooperating with the casing, said method comprising:

providing a surface on the plug such that the valve member engages the surface;

biasing the valve member into engagement with the plug by a resilient member; and

energizing the plug and casing to join the plug and casing;



said energizing also cooperating with the biased valve member and the plug surface to form a valve seat on the plug surface.

4,084,305

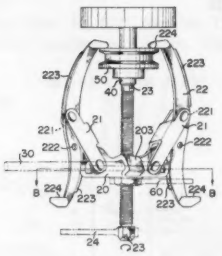
PULLEY PULLER

Yun-Te Chang, 47, Li Te 11 Road, Lin 8, Ta Te Li Tainan, China /Taiwan

Filed Dec. 23, 1976, Ser. No. 753,865

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—261 **5 Claims**



1. A puller for removing a pulley or the like from a shaft comprising an elongated base having a substantially central threaded hole therethrough, a screw rod rotatably mounted in said hole and adapted at one end to engage the end of a shaft carrying a pulley to be removed, a pair of pull pawls extending along opposite sides of said screw rod and formed at their ends corresponding to said shaft engaging end of the screw rod with pulley engaging lips, said pawls having intermediate oppositely facing inner portions bearing on opposite end portions of said base, tractive members pivoted at opposite ends to said pawls and to said base at opposite sides of said threaded hole, and slidably interfitting flange and groove means on said pawl and base end portions extending longitudinally of said pawls.

4,084,306

METHOD AND APPARATUS FOR TRANSPORTING AND WRAPPING PIPE INSULATION

Loren B. Barker, Salem, Ill., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Oct. 17, 1975, Ser. No. 623,368

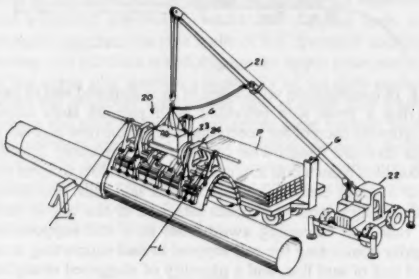
Int. Cl.[2] B21D *39/02*

U.S. Cl. 29—431 **11 Claims**

1. A method of using an apparatus for transporting and wrapping pipe insulation comprising a frame, a pair of arms, means for mounting said arms on said frame for swinging movement about a longitudinal axis, a row of longitudinally spaced vacuum pads on each arm, a pair of transversely spaced rows of longitudinally spaced vacuum pads positioned inwardly of said first-mentioned rows on said arms, a second pair of vacuum pads fixedly mounted on said frame for engagement with the insulation of the pipe, means for selectively supplying vacuum to each said row of vacuum pads, and means for swinging said arms toward and away from one another, a member extending circumferentially and radially inwardly on the end of one said arm and functioning to tuck the one edge of the insulation onto the other edge of the insulation, said one of each said vacuum pads on said arm being interconnected with one of said pair of vacuum pads by a flexible member, said flexible member passing over pulleys rotatably mounted on said frame such that as the arms are moved toward one another, said vacuum pads of said pair of rows are moved upwardly and when said arms are extended, said vacuum pads of said pair of rows move downwardly under the action of gravity, which method comprises

extending said arms,

bringing said arms adjacent a panel to engage said panel with said vacuum pads on said arms,



lifting and transporting said frame to lift and transport said panel toward a pipeline,

swinging said arms toward one another to form said panel into a U shape,

lowering said frame to move said panel over said pipe,

continuing said lowering of said frame until said panel engages said pipe and said second pair of vacuum pads engage said panel,

releasing the vacuum on the outer rows of said vacuum pads on said arms,

and moving said arms toward one another to completely wrap said panel about said pipe.

4,084,307

METHOD OF JOINING TWO CABLES WITH AN INSULATION OF CROSS-LINKED POLYETHYLENE OR ANOTHER CROSS LINKED LINEAR POLYMER

Göran Schultz, Sundsvall, and Karl-Gunnar Wiberg, Stockholm, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

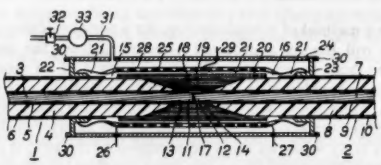
Continuation of Ser. No. 482,850, Jun. 25, 1974, abandoned.

This application Nov. 11, 1976, Ser. No. 740,969

Claims priority, application Sweden, Jul. 11. 1973, 7309706

Int. Cl.[2] B29C *27/26;* H01R *5/00*

U.S. Cl. 29—460 **6 Claims**



1. The method of forming a splice between two electrical conductors having a cross-linked polymer insulation, comprising: removing the insulation from said conductors adjacent the ends thereof to be joined so as to leave the end portions of said conductors bare, joining the bare ends of said conductors, wrapping the joined ends of said conductors and portions of insulation adjacent said joined ends with plural layers of a

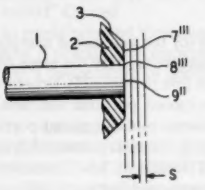
cross-linkable linear polymer tape containing a cross-linking agent for said polymer, forming a tape-wrapped joint, disposing a heating means about and in thermally conducting solid contact with said tape-wrapped joint, disposing a pressure envelope about said tape-wrapped joint and said heating means so as to encompass said heating means therewithin, heating said tape-wrapped joint by said heating means and supplying gas having a pressure above atmospheric pressure to said pressure envelope so as to concurrently compress said tape-wrapped joint and melt said layers together and crosslink said polymer.

4,084,308

SLICING METHOD IN FIBER END PREPARATION

Peter Klaus Runge, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 22, 1976, Ser. No. 743,588
Int. Cl.[2] B23P *17/00, 25/00*
U.S. Cl. 29—527.2 **21 Claims**



1. In a method of preparing one or more brittle fiber ends each one of which has a respective axis and sliceable material shrunk thereon, the steps comprising

initially slicing through said material and each said fiber end in a slicing plane, thereby to produce with respect to each said end a substantially planar cut fiber end surface oblique relative to said slicing plane, each said cut end having a longitudinal dimension along its respective axis;

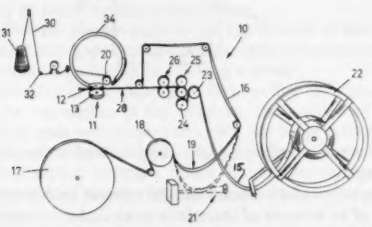
and again slicing in a parallel plane with an advancement of said slicing plane not in excess of said longitudinal dimension so that a portion of each said oblique cut end surface is replaced with a respective surface portion parallel to said slicing plane.

4,084,309

APPARATUS AND METHOD OF MANUFACTURING FLEXIBLE DUCTING

Cecil Howard Wood, 129 Arnold Ave., Thornhill, Canada

Filed Aug. 9, 1976, Ser. No. 712,483
Int. Cl.[2] B23Q *5/00*
U.S. Cl. 29—561 **2 Claims**



1. An apparatus for forming flexible ducting from a channel-shaped strip of metal and a strip of flexible material wherein said metal strip is formed into a spiral with said material forming a web between adjacent coils of the spiral and wherein said metal is exposed outwardly of the ducting formed thereby to protect the flexible material forming the webbing of the ducting, comprising in combination;

a work station having a bed thereon;

a means for feeding said strip of metal to said work station to underlie said strip of flexible material disposed parallel to said metal strip, said flexible material being drawn onto said bed of said work station by movement of said metal strip underlying said material;

a roll member rotatably mounted above said bed to urge an edge of said material downwardly between the arms of said channel-shaped strip of metal when said strip of metal is fed thereunder;

a crimping means to close the channel arms of said metal strip over overlapping edges of flexible material caught therebetween;

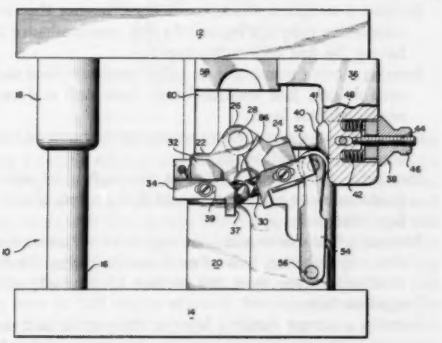
a ring-shaped guide means fastened to said work station adapted to upwardly direct the channel-shaped metal strip with the flexible material held therein, into a spiral shape and to guide them around to lie adjacent and parallel to the incoming strip of flexible material with an edge of said material held by said metal channel strip in overlapping relationship with an edge of said incoming strip of flexible material.

4,084,310

APPARATUS FOR STRIPPING AND POSITIONING AN INSULATION CONDUCTOR

Joseph Dragisic, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Feb. 23, 1977, Ser. No. 771,105
Int. Cl.[2] H02B *1/12*
U.S. Cl. 29—564.4 **8 Claims**



1. An apparatus for stripping insulation from the end of an insulated conductor and for positioning the stripped conductor for a termination operation, said apparatus comprising:

two support members each carrying an insulation-piercing knife and a conductor-gripping means, one said member being stationary and the other member being pivotally mounted to move between an open position wherein said knives and gripping means are spaced apart and a closed position wherein said knives pierce the insulation of the conductor and the gripping means engage and hold the conductor therebetween;

first cam means coacting with said other member to shift said other member from said open position to said closed position;

second cam means coacting with said gripping means to displace said gripping means along the longitudinal axis of said conductor;

means cooperating with said first cam means for adjusting the closed position of said other member to accommodate conductors of varying diameters;

means cooperating with said gripping means for adjusting

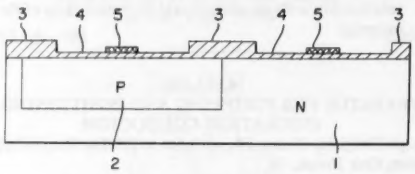
the displacement of said gripping means to properly position the conductor for the termination operation; and means for actuating both said first and second cam means in a predetermined operating sequence.

4,084,311

PROCESS FOR PREPARING COMPLEMENTARY MOS INTEGRATED CIRCUIT

Akihiko Yasuoka, and Hiroshi Shibata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 732,859
Claims priority, application Japan, Oct. 17, 1975, 50/124917
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **6 Claims**



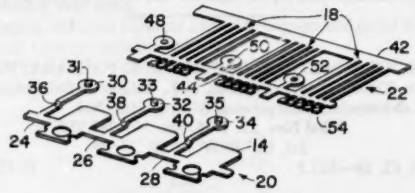
1. A process for preparing complementary MOS integrated circuit which comprises the steps of:
- forming a second semiconductor layer having the second conductive type in a region of a first semiconductor layer having the first conductive type;
- forming a oxide membrane on a first predetermined surface zone of said first semiconductor layer and said second semiconductor layer;
- forming a gate electrode on a second predetermined surface zone on said oxide membrane;
- forming a first masking layer at the surface of said first semiconductor layer except said first predetermined surface zone;
- forming a first source and drain regions of a P channel transistor by injecting ions of an impurity having the scond conductive type from the surface of the body of said semiconductor;
- forming a second masking layer at the part of said second semiconductor layer except said first predetermined surface zone;
- forming the first source and drain regions of a N channel transistor by injecting ions of an impurity having the first conductive type from the surface of the body of said semiconductor;
- forming a silicon nitride membrane on said oxide membrane and said gate electrode;
- forming contact holes in said silicon nitride layer on a third predetermined surface zone on said first source and drain regions which is narrower than the silicon nitride layer;
- removing said oxide membrane from beneath the contact holes;
- forming the second source and drain regions of said P-channel transistor by diffusing an impurity having the second conductive type from said contact holes on said P-channel transistor region;
- forming the second source and drain regions of said N channel transistor by diffusing an impurity having the first conductive type from said contact holes of said N channel transistor region; and
- forming contacts at said source and drain regions.

4,084,312

ELECTRICALLY ISOLATED HEAT SINK LEAD FRAME FOR PLASTIC ENCAPSULATED SEMICONDUCTOR ASSEMBLIES

Glenn E. Kirk, Mesa, and Alfred L. Medesha, Apache Junction, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 7, 1976, Ser. No. 647,234
Int. Cl.² H01L *23/28, 23/48*
U.S. Cl. 29—588 **6 Claims**



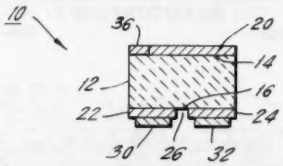
1. A process for the automated manufacture of semiconductor devices characterized by the steps of:
- (a) forming a first preassembly structure comprising a plurality of die mount portions and first joining means interposed between said die mount portions;
- (b) forming a second preassembly structure comprising groups of separated lead members and second joining means interspersed between said groups;
- (c) forming a composite lead frame by joining said first and said second joining means;
- (d) mounting semiconductor die on said die mount portions and wire bonding said die to said lead members;
- (e) plastic encapsulating said semiconductor devices; and
- (f) shearing away said joining means to produce individual semiconductor devices each having a die mount portion which is electrically isolated from its device leads.

4,084,313

METHOD OF ADJUSTING RESISTANCE OF A THERMISTOR

Milton Schonberger, 195 Fern St., Westwood, N.J. 07885

Filed Apr. 14, 1977, Ser. No. 787,422
Int. Cl.² H01C *7/04*
U.S. Cl. 29—593 **38 Claims**



1. A method of adjusting the resistance of a thermistor, comprising:
- forming a first and a second electric contact on one surface area of an element of thermistor semiconductor material;
- forming a third electric contact on another surface area of the element of thermistor semiconductor material, whereby the element of thermistor semiconductor material and the first, second and third contacts together comprise a thermistor;
- adjusting the resistance of the thermistor by trimming off part of at least one contact to reduce its area.

4,084,314
PRODUCING THICK FILM CIRCUITS HAVING TERMINAL ELEMENTS

Naresh Chakrabarty, Germering, and Artur Weitze, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 22, 1977, Ser. No. 770,368
Claims priority, application Germany, Feb. 20, 1976, 2606963
Int. Cl.² H05K *3/30, 3/34*
U.S. Cl. 29—626 **26 Claims**

1. A process for the production of a thick film circuit with terminal elements on an inorganic substrate comprising the steps of

(A) applying a metal powder layer to predetermined localized surface portions of said substrate, said metal powder comprising on a 100 weight percent total powder weight basis from about 92 to 96 weight percent of silver having a particle size of from about 1 to 10 microns, and from about 4 to 8 weight percent of copper oxide having a particle size of less than about 2 microns,

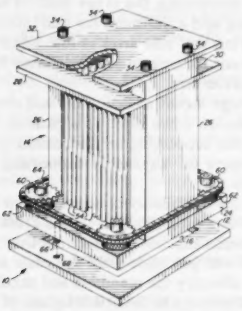
(B) sintering said metal powder layer at a temperature of from about 930° to 935° C., and

(C) hard soldering to predetermined locations over individual conductor paths a plurality of respective individual terminal elements at a temperature of about 820° C.

4,084,315
FIXTURE FOR SOLDERING INTEGRATED CIRCUIT CHIPS TO A MULTILAYER SUBSTRATE

Mark Joseph Michaels, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 30, 1976, Ser. No. 755,525
Int. Cl.² H01L *21/60*
U.S. Cl. 29—740 **8 Claims**



1. A fixture for use in batch soldering integrated circuit chips to a substantially rectangular multilayer substrate,

said substrate having a top surface,

a plurality of chip pads on the top surface of the substrate said chip pads having a predetermined location on the top surface, each chip pad having a center,

a plurality of chip lead pads surrounding each chip pad on the top surface of the substrate, the position of the chip lead pads with respect to a chip pad being predetermined;

integrated circuit chips having a bottom and top surface, the top surface having a center, the bottom surface of each integrated circuit chip having attached to it a back metal layer,

a plurality of flexible beam leads, one end of each beam lead being bonded to an electrical contact on the top surface of each chip, said chips being positioned on the substrate so that the back metal layer is substantially directly above a chip pad and so that the beam leads of each chip are above corresponding chip lead pads; said fixture comprising:

a base, a rectangular aperture in said base, the dimensions of the aperture being such that a multilayer substrate fits within the aperture; and

a force structure having force pin alignment means,

a plurality of force pins mounted for limited linear reciprocal movement in the pin alignment means, a tip formed at the bottom of each force pin;

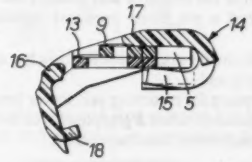
means for aligning the force structure with the base comprising a pair of alignment bores formed in one and a pair of alignment pins mounted on the other, said bores and pins being positioned so that when the alignment pins are inserted into the alignment bores, the tips of the force pins are substantially aligned with the centers of chips positioned on chip pads of a substrate positioned in the base, and

means for varying the distance between the force structure and the base so that the weight of the force pins can be gradually applied to and removed from the chips positioned on chips pads of a substrate placed in said base.

4,084,316
SAFETY RAZORS

John Frederick Francis, Horsell, England, assignor to The Gillette Company, Boston, Mass.

Division of Ser. No. 618,634, Oct. 1, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,761
Claims priority, application United Kingdom, Oct. 8, 1974, 43528/74
Int. Cl.² B26B *21/22, 21/52*
U.S. Cl. 30—47 **8 Claims**



1. A shaving unit comprising narrow elongated blade means having a cutting edge means thereon, frame means including a thin elongated first portion, a thin elongated second portion, said first and second portions being joined by thin elongated end portions, said first, second and end portions defining a slot therebetween, said first portion having a support portion having a substantially flat surface thereon, said blade means being permanently secured over its full length to said surface and being over its full length adjacent thereto, said cutting edge means projecting clear of said support portion, and metal housing means disposed about said frame means and retaining said frame means and said blade means therein, said housing means providing a guard surface extending parallel to said blade means, said frame means including mounting portions retained in said housing by a deformed portion of said housing clamped about said mounting portions.

4,084,317
SHEARING TOOL FOR SYNTHETIC RESIN TUBES

Masahiko Nakamura, Matsuzaka, and Hidehiko Itou, Hisai, both of Japan, assignors to Matsuzaka Iron Works, Inc., Tsu, Japan

Filed May 3, 1977, Ser. No. 793,320
Claims priority, application Japan, Dec. 11, 1976, 51-166532[U]
Int. Cl.² B23D *21/06;* B26B *27/00;* B26D *3/16*
U.S. Cl. 30—94 **6 Claims**

1. A shearing tool for synthetic resin tubes comprising: an upper handle portion;

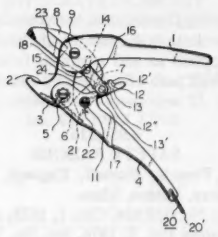
a lower jaw connected to the leading end of said upper handle portion and provided with an arcuate tube receiving recess in the upper surface of said jaw;

said upper handle portion being further provided with a blade receiving opening extending from the forward portion of said upper handle portion to the leading end of said lower jaw;

a lower handle portion pivoted at the leading end of said lower handle portion to said lower jaw;

a shearing blade pivoted in an intermediate position of the length of said blade to said upper handle portion within said opening and having an engaging pawl formed at and extending downwardly from the rear end of said blade;

said shearing blade further including a slot formed in the rear portion thereof;



a rocking bar pivoted at one end to the forward portion of said lower handle portion and provided with notches in the upper surface of the rocking bar;

a connection link pivoted at one end to an intermediate position of the length of said rocking bar and having at the other end a pin freely received within said slot in the blade;

a spring normally urging said rocking bar against said engaging pawl; and

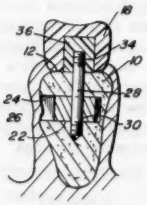
a return spring for returning said lower handle portion to the initial position when a gripping force is released from said upper and lower handle portions.

4,084,318

STABILIZED DENTAL IMPLANT

Charles M. McEachern, 3114 Old Canton Rd., Jackson, Mich. 39216

Filed Apr. 9, 1974, Ser. No. 459,373
Int. Cl.[2] A61C *13/22*
U.S. Cl. 32—10 A **4 Claims**



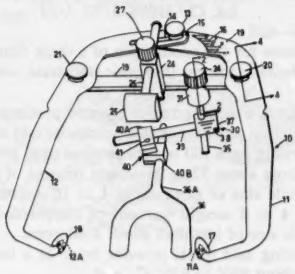
1. A method of attaching dental appliances to the jawbone of a user comprising the steps of: forming a first hole transversely through the jawbone; inserting a drill jig into said first hole to establish a guide axis through the jawbone intersecting said first hole; drilling a second hole in the jawbone along said guide axis; withdrawing the drill jig from the first hole; inserting an anchor element into the first hole, said anchor element having a length less that that of the first hole and a transverse bore adapted to be axially aligned with the second hole; inserting a fastener to which a dental appliance is secured at one end through said second hole and the bore in the inserted anchor element; and securing the fastener to the jawbone independently of the anchor element.

4,084,319

FACE BOW

William Basil Dragan, R.F.D. No. 1 Burr St., Fairfield, Conn. 06430

Filed Aug. 2, 1976, Ser. No. 710,551
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—21 **11 Claims**



1. A face bow comprising:

a pair of side arms having one end thereof inturned for insertion into the depression anterior and medial to the tragi of a patient's ears,

an ear piece detachably connected to the inturned end of each of said side arms, said ear piece being adapted to be inserted in a patient's ear when said face bow is fitted to a patient and adapted for mounting said face bow to a given articulator.

a cross bar interconnected between said side arms intermediate the length thereof about which said side arms pivot for adjusting said side arms to a patient's intercondylar size,

means for connecting the other ends of said side arms for facilitating said adjustment for said intercondylar size and for securing said side arms in said adjusted position,

indicies means formed on said side arms for indicating said intercondylar size,

a nasion gauge means mounted on said cross bar for engaging the nasion when fitted to a patient,

a bite fork for supporting an impression of a patient's bite,

a toggle means for adjustably supporting said bite fork to said cross bar,

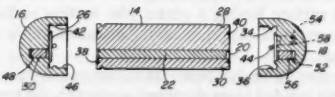
and means for detachably connecting said toggle means and bite fork supported thereon to said cross bar whereby said toggle means and bite fork secured thereby can be readily removed and put aside until the casts are to be mounted thereon whereby the mandible and maxilla relationship of one's bite relative to the oribital plane of the patient's head is maintained and which relationship can be readily re-established to a given articulator.

4,084,320

SYSTEM FOR MIXING AND DISPENSING DENTAL AMALGAM

Lewis Skeirik, 24 Central St., Georgetown, Mass. 01833

Filed Jul. 21, 1976, Ser. No. 707,296
Int. Cl.[2] A61C *5/04*
U.S. Cl. 32—60 **10 Claims**



1. A system for mixing and dispensing dental amalgam, comprising

(a) a capsule adapted to contain constituents for said amalgam, and

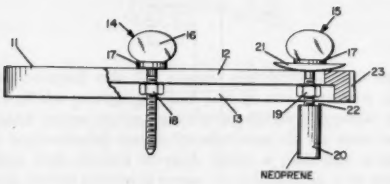
(b) a dispenser operatively connectable to said capsule and adapted to discharge said amalgam from said capsule,
(c) said capsule being formed with separate chambers for separately storing said constituents and means for connecting said chambers for mixing said constituents,
(d) said capsule including a body portion formed with a through passage adapted to contain one of said constituents and at least one cap formed with a cavity adapted to contain another of said constituents,
(e) said cap being movably connected to said body portion whereby said cavity may be moved from a misaligned position to an aligned position with respect to said passage.

4,084,321

MASON'S GUIDE

Charles W. Huston, 6931 Waterloo Rd., NW., Canal Wilchester, Ohio 43110

Filed Jun. 11, 1975, Ser. No. 586,065
Int. Cl.[2] B44D 3/00
U.S. Cl. 33—86 **3 Claims**



1. A device for anchoring and positioning an aligning cord, comprising in combination:
(a) a clamp element having an elongated aperture and having a channel parallel with and substantially co-incident in length with said aperture;
(b) two protruding elements each consisting of a screw having a head at one end and each extending slidably through said aperture and each having at least one end formed with external screw threads extending outwardly a substantial distance from said aperture;
(c) retaining means comprising internally threaded nuts acting in cooperation with the external threads of said protruding elements for holding said elements attached to said clamp element while allowing manual positional adjustment of said protruding elements within said aperture;
(d) a cord securing means comprising a convex washer having a centrally disposed aperture positioned on the same end of one of the protruding elements as is the head thereof for securing an aligning cord to the element; and
(e) a neoprene sleeve member located on the end of one of the protruding members opposite to the side of said clamp element on which said convex washer is positioned and spaced sightly from said clamp element to provide a space for positioning the aligning cord.

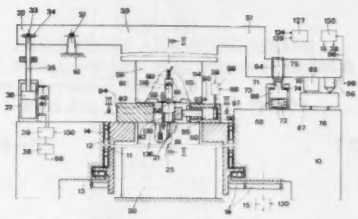
4,084,322

APPARATUS FOR MEASURING GEOMETRICAL DIMENSIONS AND/OR ERRORS ON A MECHANICAL PART

Gastone Albertazzi, Bologna, Italy, assignor to Finike Italiana Marposs Soc. In. Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed May 25, 1976, Ser. No. 689,839
Claims priority, application Italy, Jun. 13, 1975, 3442 A/75
Int. Cl.[2] G01B 7/00, 7/12
U.S. Cl. 33—174 L **11 Claims**

1. Apparatus for measuring geometrical dimensions and/or errors on a mechanical part, comprising:
a base;
a first support carried by said base;
a second support carried by said base, the second support being movable with respect to the base;
measuring means mounted on at least one of said first and second supports, said measuring means comprising movable feeler means with at least one movable arm having a direct-contact feeler and position transducer means responsive to the position of the feeler means;
first actuating means coupled with said second support to control a relative displacement between the two supports in order to move said supports toward and away from each other;
a locking device movably carried by said base and adapted to cooperate with said part to lock and support the part in a fixed position with respect to said locking device;
second actuating means adapted to cause a relative movement between said locking device with said part and said base in order to permit said feeler means to explore the respective portion of said part;
processing means connected with said measuring means to process the signals supplied by the transducer means during the exploration of the feeler means on said part;



thrust means carried by said first support for cooperating with said part and applying a supporting thrust to the latter;
first reference means carried by the second support in order to cooperate mechanically with said part and push it towards the first support after the action of said first actuating means, overcoming the action of said thrust means;
second reference means associated with at least said second support to cause the stopping of said first actuating means at a first relative position of said supports;
first control means connected to said locking device to control the locking of said part when the first relative position of the two supports is reached;
second control means adapted to deactivate said first actuating means in response to the two supports reaching said first relative position; and
further thrust means adapted to cause, upon deactivation of said first actuating means, the movement of said second support and of said first reference means from said part to a predetermined measuring position with respect to said base to permit said relative movement between said part and the measuring means and the consequent effecting of the measurements.

4,084,323

MEASURING APPARATUS

David Roberts McMurtry, Wooton-under-Edge, England, assignor to Rolls-Royce Limited and Renishaw Electrical Limited, Great Britain

Filed May 10, 1976, Ser. No. 685,072
Claims priority, application United Kingdom, May 13, 1975, 20019/75
Int. Cl.[2] G01B 5/00, 7/00
U.S. Cl. 33—174 L **4 Claims**

1. A probe for use in measuring apparatus having stylus support structure comprising:

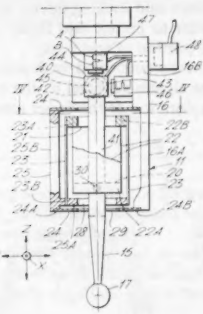
a first and a second rigid member arranged in spaced relationship;

a first pair of generally flat resilient members arranged in spaced parallelism and secured to the first and second rigid members in position therebetween;

a third rigid member having a first part situated adjacent the first rigid member;

a second pair of generally flat resilient members arranged in spaced parallelism and in positions forming with the first resilient members four sides of a notational six-sided rectangular block, the second pair of resilient members being secured to the second rigid member and to said first part of the third rigid member in position therebetween, the third rigid member having a second part extending from said first part towards the second rigid member;

a fourth rigid member, the fourth rigid member and said



second part of the third rigid member being situated at opposite sides of the assembly comprising the first and second pairs of resilient members;

a third pair of spaced apart generally flat resilient members arranged in parallel planes perpendicular to the planes of the first and second resilient members and in positions to form the fifth and sixth sides of said notional block, the third pair of resilient members being secured to the fourth rigid member and said second part of the third rigid member in positions therebetween, wherein said resilient and rigid members are positioned and dimensioned such that the first and fourth rigid members are movable relative to one another in three orthogonal dimensions, and wherein one of the first and fourth rigid members constitutes a support for said stylus support structure and the other one of the first and fourth rigid members constitutes a support for a stylus.

4,084,324

MEASURING INSTRUMENT

David John Whitehouse, Melton Mowbray, England, assignor to The Rank Organisation Limited, London, England

Filed Apr. 23, 1976, Ser. No. 679,819

Claims priority, application United Kingdom, Apr. 23, 1975, 16813/75; Jan. 7, 1976, 00475/76

Int. Cl.[2] G01B *7/34, 7/28*

U.S. Cl. 33—174 L **31 Claims**

1. In a surface measurement apparatus of the type wherein a sensor is traversed along a path in sensing relation with the surface of a component under test and operates to produce sensor output signals representing the surface under test,

the improvement wherein:

said sensor comprises first, second and third transducers,

each said transducer being individually and equally sensitive to surface variations and operating to produce an output signal P_1, P_2, P_3 respectively,

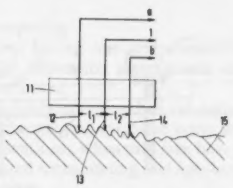
common support means mounting said first, second and third transducers spaced from one another by respective predetermined distances, and in relative positions such that each transducer traverses substantially the same path over the surface of the component upon relative movement of said common support and the component under test, the spacing of said common support from the surface of the component under test providing a reference datum for the transducers in generating the output signals thereof, amplifier means for amplifying the said output signals P_1, P_2, P_3 from said first, second and third transducers respectively such that said output signals are related by relative factors of a, l and b respectively, and

means for combining the output signals from the transducers to produce a composite signal S of the form $S = aP_2 + bP_3 - 2P_1$ which includes no component due to significant imperfections in the reference datum.

18. In a surface measurement apparatus of the type wherein a sensor is traversed along a path in sensing relation with the surface of a component under test and operates to produce sensor output signals representing the surface under test,

the improvement wherein:

said sensor comprises first, second, third and fourth transducers,



each said transducer being individually sensitive to surface variations and operating to produce an output signal P_1, P_2, P_3, P_4 respectively,

common support means mounting said first, second, third and fourth transducers spaced from one another by respective predetermined distances, and in relative positions such that each transducer traverses substantially the same path over the surface of the component upon relative movement of said common support and the component under test, the spacing of said common support from a fixed surface providing a reference datum for the transducers in generating the output signals thereof, amplifier means for amplifying said output signals P_1, P_2, P_3 and P_4 from said first, second, third and fourth transducers in such a way that, after amplification, said output signals are related by factors l, a, b, and c respectively where $l+a+b+c=0$, and

means for combining the output signals from the transducers to produce a composite signal S of the form $S = P_1+aP_2+bP_3+cP_4$ which includes no component due to significant imperfections in the reference datum.

4,084,325

CENTER FINDER

Hiram Jones, Jr., R.D. No. 1, Box 130B, Ellwood City, Pa. 16117

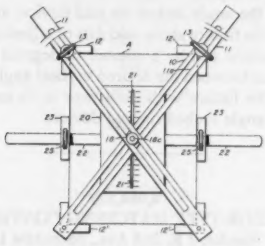
Filed Apr. 15, 1976, Ser. No. 677,080

Int. Cl.[2] B25B *5/02;* **B25D** *5/00*

U.S. Cl. 33—191 **6 Claims**

1. In an improved center-finding assembly for accurately locating the center of a workpiece of substantially symmetrical shape, a pair of longitudinal gauging arm members, a center-seeking indicator of spool-like shape cross-connecting said pair of arm members together in a slidable-pivotal relation with respect to each other, a pair of edge-engaging guide elements for each of said arm members, one guide element for each said arm member being pivotally non-slidably mounted thereon adjacent one end thereof, the other guide element for each said arm member being a slide guide element pivotally and endwise-adjustably mounted thereon adjacent the opposite end

thereof for relative movement into and out of a substantially complementary engagement against an edge portion of the workpiece that is opposite to the edge portion thereof that is being engaged by said one guide element, said indicator permitting said pair of arm members to be adjusted as to their cross-extending angular relationship with respect to each other and being automatically slidable into a centering position with respect to a face of the workpiece when said pair of guide elements of each of said arm members are moved into opposite edge-engaging positions with respect to the workpiece, said pair of guide elements for each of said arms having an open



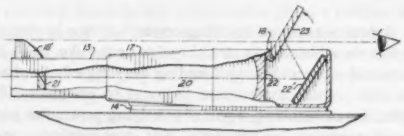
concave-shaped side for aligned engagement with opposed edges of the workpiece, said pair of arm members in their mounted center-locating positioning defining opposite pairs of open angle-shaped spaces therebetween of the same angular relation with respect to each other, a plate-like protractor having central mounting means for positioning it on and with respect to said center indicator, said protractor having slot portions therealong in an aligned and outwardly extending relation from said central mounting means, and graduations along said slot portions for determining points therealong of selected distance from a center point determined by said indicator.

4,084,326

GUN SIGHT

Jody L. Numbers, 7908 E. Oak, Scottsdale, Ariz. 85257

Filed Jun. 28, 1976, Ser. No. 700,385
Int. Cl.[2] F41G *1/38*
U.S. Cl. 33—245 **9 Claims**



1. A sight mechanism for a weapon having a barrel, said mechanism comprising:
an elongated housing for mounting on a gun,
a telescopic sight mounted in said housing for receiving said target image through a given line of sight,
said telescopic sight having a first reflective means for reflecting said target image from said given line of sight to intersect another line of sight,
a second reflective means mounted on said housing for selective movement to a first position out of said another line of sight, and to a second position to receive the reflected target image and to direct it along said another line of sight, and
means for selectively moving said second reflective means into said first and second positions
said means for selectively moving said second reflective means being actuated to move said second reflective means to said second position by pulling a trigger arried by the gun,
and being actuated to return said second reflective means to said first position upon release of the trigger.

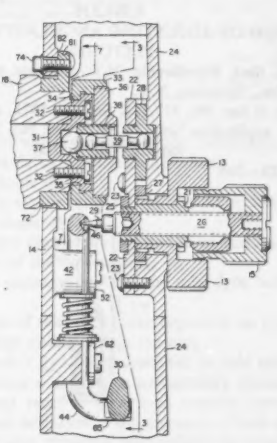
6. A sighting mechanism for a gun comprising:
an elongated housing for mounting on a barrel of a gun longitudinally thereof,
a pair of iron sights one mounted at each end of said housing for presenting a target image therethrough in a first line of sight,
a telescopic sight mounted in said housing parallel with said iron sights for receiving and enlarging at least a part of said target image through a second line of sight,
said telescopic sight having a first reflective means for reflecting said target image from said first line of sight to intersect with said second line of sight,
a second reflective means movable from a first position out of said first line of sight to a second position for receiving said target image from said first reflective means of the telescopic sight and to direct it along said first line of sight, and
means for selectingly moving said second reflective means into said first and second positions.

4,084,327

THEODOLITE ADJUSTING MEANS

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Aug. 18, 1976, Ser. No. 715,602
Int. Cl.[2] G01C *1/00*
U.S. Cl. 33—299 **7 Claims**



1. In a geodetic instrument comprising an alidade including a pair of standard housings and an axle journalled therebetween mounting a telescope for line of sight elevation displacement, the improvement in means for controlling and effecting fine adjustment in said elevation displacement, said improvement comprising:
(a) means presenting an annular shoulder situated within one of said pair of standard housings and affixed to one end of said axle, said annular shoulder being arranged for coaxial rotation with said axle;
(b) means presenting an annular flange loosely encompassing said shoulder within the confines of said annular flange and being capable of coaxial rotation and limited axial displacement with respect to said shoulder means, said encompassing means having a threaded axial bore;
(c) threaded nipple means engaged in said encompassing means axial bore and bearing axially upon said axle end, whereby rotation of said nipple means in a first direction will result in the generation of an axial force acting be-

tween said axle end and said encompassing means to effect said encompassing means axial displacement with resulting clutching engagement between said annular shoulder and said encompassing means annular flange portion, thereby fixing said encompassing means to said axle for coaxial rotation therewith;

(d) first drive means accessible from the exterior of said one housing, whereby a rotary force applied thereto may be transferred to the interior of said housing;

(e) means linking said first drive means to said nipple means whereby rotation of said nipple means may be effected by application of rotary force to the exterior accessible element of said first drive means;

(f) a lever arm affixed to said encompassing means and extending radially therefrom within said one housing;

(g) lever means within said one housing arranged to shift the direction of an applied rectilinear force from one substantially parallel to the axis of said axle to one substantially tangent to a path of circular revolution about said axis, and to transfer said redirected force to said lever arm;

(h) second drive means accessible from the exterior of said one housing, whereby a rotary force applied thereto may be converted to an axial rectilinear force directed to the interior of said housing; and

(i) means linking said second drive means to said lever means, whereby displacement of said lever arm and concurrent rotation of said encompassing means therewith may be effected by application of rotary force to the exterior accessible element of said second drive means.

4,084,328

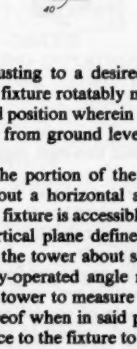
METHOD OF ADJUSTING ANGULARITY OF LIGHT FIXTURES

Arthur S. Shai, Fayetteville, N.Y., assignor to Jaquith Industries, Inc., Syracuse, N.Y.

Division of Ser. No. 617,182, Sep. 26, 1975, abandoned. This application Nov. 23, 1976, Ser. No. 744,428

Int. Cl.[2] G01C *9/00*

U.S. Cl. 33—368 **6 Claims**



1. A method of adjusting to a desired vertical angle the major axis of a lighting fixture rotatably mounted upon a rigid tower having an erected position wherein the lighting fixture is at a height inaccessible from ground level, said method comprising:

a. pivoting at least the portion of the tower carrying the lighting fixture about a horizontal axis to a position of repose wherein the fixture is accessible from ground level, and noting the vertical plane defined by the major axis during pivoting of the tower about said horizontal axis;

b. attaching a gravity-operated angle measuring device to said portion of the tower to measure the vertical angle of the major axis thereof when in said position of repose;

c. attaching said device to the fixture to measure the vertical angle of the major axis thereof with the tower in said position of repose;

d. rotating the fixture about an axis perpendicular to said plane and trough an angle which is the sum of the desired angle of elevation and the previously measured angle of repose of step (b) substracted from 90° as measured by said device;

e. pivoting the tower about said horizontal axis to its erected position, returning the fixture to the inaccessible height with said device attached thereto;

f. allowing said device to come to an equilibrium position, indicating the angle of elevation of said major axis of the fuxture with the tower in its erected position and locking said device in said equilibrium position by locking means controlled at ground level;

g. pivoting the tower about said horizontal axis back to its position of repose;

h. reading the angle locked on said device; and

i. rotating the fixture about said axis of adjustment of step (d) in a direction and by a number of degrees reflecting any difference between the desired vertical angle of said major axis of the fixture with the tower in its erected position and the angle locked on said device.

4,084,329

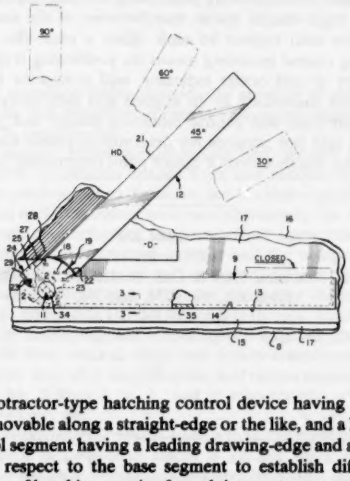
PROTRACTOR-TYPE HATCHING CONTROL DEVICE

Glenn Talley Randol, 3 E. 2nd Ave., Mountain Lake Park, Md. 21550

Filed Oct. 5, 1976, Ser. No. 729,691

Int. Cl.[2] B43L *13/24*

U.S. Cl. 33—115 **3 Claims**



1. A protractor-type hatching control device having a base segment movable along a straight-edge or the like, and a hatching control segment having a leading drawing-edge and adjustable with respect to the base segment to establish different angularities of hatching, a pair of overlying protractor portions on said segments, respectively, and concentrically-oriented with respect to a common axis with one portion graduated in degrees selectively registrable with a reference mark on the other portion to facilitate setting the control segment in its selected hatching angularity, wherein the improvement comprises: a control flange defining the working-edge of the base segment slidable along the straight-edge, said flange producing in the base segment space for reception of the control segment when the device is inoperative; a transverse channel indented normal to the drawing-edge in the protractor portion of the control segment; a line-spacing control member slidably disposed in the channel between the protractor portions for establishing the selected hatching space; a threaded stem defining the common axis with one end fast on one of the protractor portions, and projecting through an aligned-hole in the other protractor portion; and a locknut threadingly engaging the free end of the threaded stem to lock the protractor portions and slidably interposed control member in adjusted positions to move as a unit with their respective segments for hatching.

4,084,330
FLASK FOR FREEZE DRYING WITH ADJUSTABLE SEAL

Douglas S. Fraser, New Platz, N.Y., assignor to FTS Systems, Inc., Stone Ridge, N.Y.

Filed Jul. 2, 1976, Ser. No. 702,345
Int. Cl.[2] F26B *13/30*
U.S. Cl. 34—92 7 Claims

1. A vessel assembly for freeze drying formed of materials reisstant to chemical action and extremes in temperature and pressure comprising a sample container having a mouth and an interior wall surface at an open end thereof, a cover assembly, said cover assembly being adapted for mounting in a positive fluid-tight manner to close said mouth, said cover assembly including a compression plate and a retainer plate, said retainer plate having an annular channel on an upper surface, said retainer plate being integral with an upstanding neck, said neck having a passageway for attachment to a vacuum source for the application of vacuum to said sample container, said passageway being in communication with the interior of said sample container when said cover assembly is mounted on said mouth of said container, said compression plate having a radially extending flange providing a seat for placement of said cover assembly on said mouth, said retainer plate being adjustably movable towards said compression plate, a resilient annular sealing means in a given position between said retainer plate and said compression plate, said retainer plate and said compression plate engaging said sealing means on opposing sides and compressing said sealing means for radial expansion outward while being retained in said given position, said compression being caused by the movement of said retainer plate towards said compression plate for the engagement of said compression sealing means with said interior wall surface of said sample container in a reliable thermally resistant fluid-tight seal while retaining said constant radius.

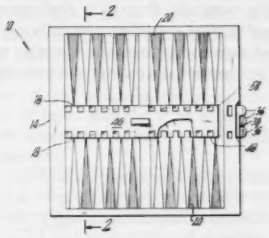
4,084,331
BACKGAMMON TEACHING DEVICE

Le Roi G. Nottoli, 5843 N. Cicero Ave., Chicago, Ill. 60646

Filed Oct. 27, 1976, Ser. No. 723,260
Int. Cl.[2] G09B *19/22*; A63F *3/00*
U.S. Cl. 35—8 R 4 Claims

1. A Backgammon Teaching Device comprising a board of conventional Backgammon design,

trough extending across the central portion of the board adaptable to contain a plurality of movable components, means embodying a plurality of window like openings adapted to slide within the trough, and a plurality of

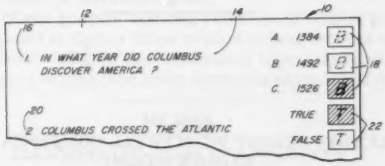


instruction cards within said trough and readable upon removing the panel.

4,084,332
SYSTEM FOR VISUAL COMMUNICATION

John S. Waloszyk, 540 Wilder St., and Bernard W. Jacobs, 432 S. LaSalle St., both of Aurora, Ill. 60506

Filed Mar. 7, 1977, Ser. No. 775,390
Int. Cl.[2] G09B *3/08*
U.S. Cl. 35—9 G 20 Claims



1. A system for visual communication comprising:

(A) a substrate defining a marking surface,

(B) a visible stable dye,

(C) a normally visible reactive dye of a color different than that of the stable dye,

(D) an activator chemically isolated from said reactive dye prior to use of the system, and

(E) a solvent common to both the said dyes and the said activator,

(F) at least one of said dyes being deposited on said surface to form a first visible indicia thereon,

(G) the said other dye being deposited on said surface,

(H) said activator changing or substantially eliminating the color of said reactive dye upon contact between said activator and said dyes in the presence of said solvent,

(I) said stable dye retaining substantially its original color during said contact to provide a second indicium on said surface of a color distinctly different than that of the first indicium.

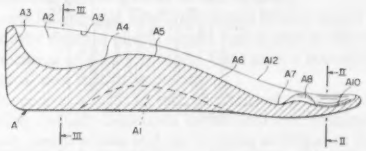
4,084,333
FOOTWEAR INNER SOLE

Oscar Del Vecchio, Via Manara 6, Falconara Marittima, Ancona, Italy

Filed Feb. 24, 1976, Ser. No. 661,045
Claims priority, application Italy, Jun. 20, 1975, 24630 A/75
Int. Cl.[2] A43B *13/38*
U.S. Cl. 36—43 4 Claims

1. A footwear inner sole, particularly for open top footwear articles, comprising a resilient shaped element having a contour which reproduces the profile of the foot, said shaped element including a heel portion, an arch portion and a toe portion, said shaped element further including a lateral upturned wall encompassing said contour at the lateral edges thereof from said heel portion to said toe portion to confine

and hold the foot to the wearer laterally, said heel portion being provided with a depression into which the heel of the foot of the wearer is received and held, said lateral wall extending substantially vertically from said depression at the rear thereof, said heel portion extending upwardly and forwardly at the front of said deepression to merge smoothly with said arch portion, said toe portion including a transversely arranged



raised portion having corrugations to receive the toes of the foot of the wearer, the height of the shaped element at the heel portion being comparable to the width thereof, the depression at the heel portion being about one-half the height thereat, said heel portion having a thickness substantially greater than the thickness at the toe portion and positioning the heel of the wearer at a higher level than the toes.

4,084,334

SUCTION DREDGE WITH SWELL COMPENSATING LADDER MOUNT

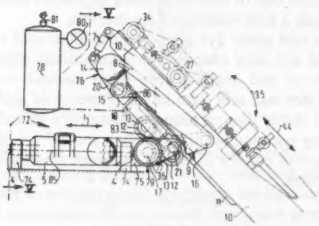
Tjako Aaldrik Wolters, Zeist, and Jan de Koning, Amsterdam, both of Netherlands, assignors to Ballast-Nedam Groep N.V., Amstelveen and Amsterdamse Ballast Bagger, Nieuwegein, both of, Netherlands

Filed Apr. 7, 1976, Ser. No. 674,446

Claims priority, application Netherlands, Apr. 15, 1975, 7504487

Int. Cl.² E02F *3/90*

U.S. Cl. 37—67 **14 Claims**



1. A cutting-head suction-dredger comprising a floating body, anchoring means for anchoring the floating body, bearing means connecting said ladder with the floating body for allowing said ladder to pivot relative to said body about an axis transverse of said body and to allow said ladder to shift back and forth longitudinally relative to said body, said ladder being rigid from its top end above the water to the lower end, and a cutting head rotatably driven and journalled at the lower end of the ladder, the bearing means comprising a rail guide extending substantially in the direction of length of the ladder and being adapted to pivot with respect to the floating body about said transverse axis and guide members adapted to move along the rail guide.

4,084,335

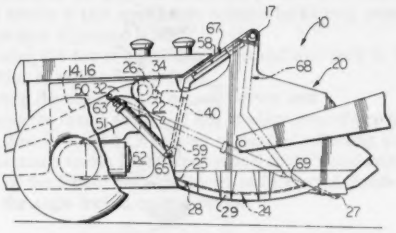
BOWL AND EJECTOR APPARATUS

Carroll R. Cole, and Robert L. Christian, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1977, Ser. No. 788,853

Int. Cl.² E02F *3/85*

U.S. Cl. 37—126 AE **6 Claims**



1. In a scraper having a frame with first and second spaced apart side elements, a bowl having sidewalls and a floor member with curvilinear surface, a lower transverse member extending across and supporting a back portion of the bowl floor member, an upper transverse member extending across and being fixedly connected at a middle portion to the front of said first and second frame side elements and at end portions to respective bowl sidewalls, the improvement comprising:

an ejector system including a blade connected above the top of the bowl and being pivotally movable relative thereto for receiving and removing material into and from the bowl,

first and second motors, each being connected to the upper transverse member at locations outwardly of said first and second spaced apart side elements, and

a power means connected to and positioned between said first and second side elements at a location below said upper transverse member.

4,084,336

VIBRATOR EQUIPPED GRAB BUCKET

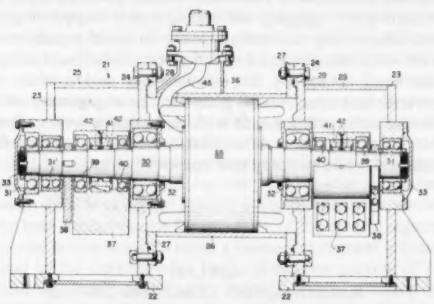
Yutaka Mizutani, Toyonaka, and Takashi Aoki, Kochi, both of Japan, assignors to Kensetsu Kikai Chosa Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1976, Ser. No. 705,832

Claims priority, application Japan, Jul. 17, 1975, 50-86723

Int. Cl.² E02F *3/44*; B66C *3/02*

U.S. Cl. 37—184 **1 Claim**



1. A grab bucket having a pair of openable and closable shells with each shell having a bottom wall and parallel side walls extending from said bottom wall, a frame, each bottom wall having means pivotably attaching one end thereof to said frame, a shaft, each side wall of each said shells having one end thereof pivotably mounted on said shaft, each said shell having another end and teeth fixed to said another end, said bottom

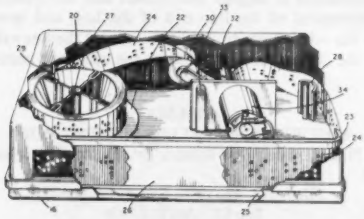
and side walls of each shell defining an interior portion thereof, one of said shells having vibrator means secured between said side walls on said interior portion of said shell so that, when said shells are opened, said vibrator means is disposed above said teeth of said shell, said vibrator means comprising a watertight casing, a shaft member rotatably secured to said casing through bearings, an electric motor having a rotor fixed on said shaft intermediate the ends thereof and a weight mounted eccentrically on each end of said shaft, each said weight comprising a stator housed in said casing, a pair of weight plates, each weight plate of each pair of weight plates having a different weight from the other weight plate of its pair, one weight plate of each pair being secured on said shaft through a one-way clutch and the other weight plate of each pair being fixedly secured on said shaft so that said two weight plates of each pair rotate simultaneously with said shaft in one direction, while only one weight plate of each pair rotates with said shaft in the opposite direction.

4,084,337

VISIBLE MESSAGE DISPLAY APPARATUS

Zane G. Tucker, 704 Greenbriar Way, Las Vegas, Nev. 89121

Filed Dec. 8, 1975, Ser. No. 638,898
Int. Cl.² G09F *11/28*
U.S. Cl. 40—472 **2 Claims**



1. In an apparatus for continuously displaying a visible message including a case member for housing components and having a window through which said message is displayed, a continuous tape having said message thereon for being viewed through said window, the improvement comprising:

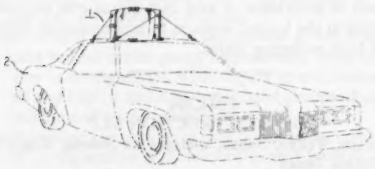
a drop-in storage reel on which said tape is wound for being continuously taken up and played out, said reel including removable tab members against which said tape is initially wound on said reel without regard to tension, and drive means for engaging and driving said tape independent of said storage reel.

4,084,338

VEHICLE-TOP SIGN DISPLAY ASSEMBLY

David J. Ross, 60 Willy Ave., Liberty, N.Y. 12754

Filed Jul. 22, 1976, Ser. No. 707,828
Int. Cl.² G09F *21/04*
U.S. Cl. 40—592 **8 Claims**



1. A vehicle-top sign assembly for displaying a pair of signs disposed edgewise in arched back-to-back relation, said assembly including:

a pair of corner supports each comprising a pair of vertically extended planes forming between them an open acute internal angle, said corner supports constructed to be fastened in spaced-apart relation on said vehicle top with their open angular ends in opposed relation to accommodate opposite lateral edges of the signs of said pair,

means for maintaining the lateral edges of said signs in rigid edgewise position inside of said corner supports comprising a pair of vertically extended wedge-shaped members, the bodies of said wedge-shaped members each comprising a pair of faces disposed at an external angle approximating the acute internal angle of a respective one of said corner supports,

means for supporting the respective edge portions of each of said signs in sandwich relation between one of the inner faces of said corner supports and a corresponding external face of one of said wedge-shaped members,

spreader means imposed transversely across said assembly including said signs, in a horizontal plane in an area intermediate between said corner supports,

each said spreader means including a pair of grippers respectively disposed to engage corresponding horizontal edge portions of each of said signs for securing the centers of said signs in back-to-back relation,

wherein said spreader means comprise an upper and a lower member each including a horizontally disposed coupling bar,

said grippers being integral with the ends of said coupling bar and extending in a direction substantially normal to the plane of said coupling bar,

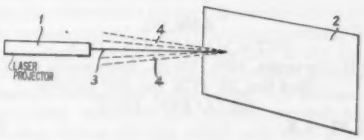
each of said grippers including two series of vertical panels disposed in slightly off-set relation to form between them a series of aligned slots constructed to accommodate the respective upper and lower horizontal edges of said signs.

4,084,339

ILLUMINATED DISPLAY APPARATUS

Raymond Peltier, 11, Square Jasmin, 75016 Paris, France, and Jean-Paul Meric, 10, rue du Dr. Roux, 75015 Paris, France

Filed Jun. 25, 1976, Ser. No. 699,686
Claims priority, application France, Jun. 26, 1975, 75 20087
Int. Cl.² G09F *13/00*; B06Q *1/00*; G03B *21/14*
U.S. Cl. 40—560 **8 Claims**



1. An illuminated display apparatus comprising a roadway a retro-reflective screen means positioned near said roadway and visible from said roadway, at least one laser projector means for emitting at least one coherent light beam towards said retro-reflective screen means, and means interposed between said laser projector means and said retro-reflective screen means for acting upon the at least one coherent light beam to produce an intelligible display on said retro-reflective screen means.

4,084,340

GUN BORE RUST INHIBITING METHOD AND APPARATUS

Gilbert Galde Scudder, 725 N. Fig, Escondido, Calif. 92025

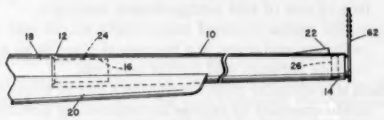
Filed Aug. 30, 1976, Ser. No. 718,557
Int. Cl.² F41C *27/08*
U.S. Cl. 42—1 N **4 Claims**

1. Apparatus for inhibiting rust in the bore of a barrel of a gun having a muzzle and a breech, said apparatus comprising:

first generally cylindrically shaped hollow capsule means

with one end open and containing a desiccant therein and having a passage means in said one end, said first capsule means having a slightly tapered outer surface toward said one end, the outer surface being of a size so that said first capsule means can be inserted into the muzzle of the gun in substantially sealing engagement, with the passage means in communication with the bore of the gun;

second generally cylindrically shaped hollow capsule means with one end open and containing desiccant therein and having passage means in said one end, the passage means of said second capsule means being located axially inward from said one end thereof so that a cylindrical side wall extends beyond said passage means, the inside surface of



said side wall being slightly smaller than the outer surface of said one end of said first capsule means, said second capsule means having a slightly tapered outer surface toward said one end, the outer surface being of a size so that said second capsule means can be inserted into the breech of the gun in substantially sealing engagement, with the passage means in communication with the bore of the gun;

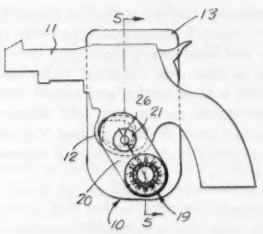
the first and second capsule means being adapted to be interfitted with the outer surface of said one end of said first capsule means engaging the inside surface of said one end of said second capsule means so that said respective passage means only communicates with each other and thereby substantially prevent depletion of said desiccant.

4,084,341

DETACHABLE GUN LOCK

Ramon H. Cervantes, 4600 78th St., Sacramento, Calif. 95820

Filed Sep. 28, 1976, Ser. No. 727,574
Int. Cl.[2] F41C *27/10*
U.S. Cl. 42—1 Y 4 Claims



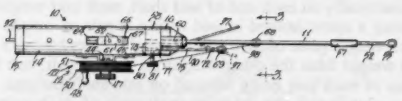
1. A detachable handgun lock comprising a back plate, a post extending integrally upwardly from said back plate and adapted to engage in a trigger guard of a gun, a lock secured to said back plate, a swingable bolt on said lock adapted to swing to a position confronting said post to secure said post in said trigger guard, said swingable bolt including a battery actuated light mounted on said bolt for illuminating said lock in the dark.

4,084,342

FISHING DEVICE

Charles R. Philip, Box 116, Haugen, Wis. 54841

Filed Jul. 16, 1976, Ser. No. 705,947
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—19.2 13 Claims



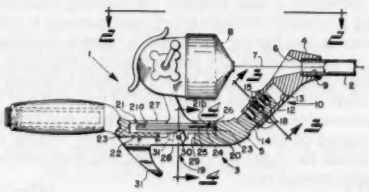
1. A fishing device, comprising: a handle; an elongate rod secured to the handle and having an end portion extending forwardly therefrom; line guide members positioned longitudinally of the rod, at least one of said guide members being spaced laterally of the rod; a line secured at one end to the handle and having a free end suspended from the end portion of the rod, the line extending through the guide members to afford a line extension between an adjacent pair of guide members; a drive motor carried by the handle; an arm spaced laterally of the rod and rotatively driven by said motor, said arm having an eccentric portion which moves through an arcuate path when the motor rotates the arm, the eccentric portion being positioned to engage and deflect said line extension to cause movement of the free end of the line; and means for varying the relative positions of the arm and the line extension to vary the deflection of the line by the eccentric portion.

4,084,343

ADJUSTABLE EYELESS FISHING ROD

Nunzio N. Genovese, 6703 Balsam Dr., Bedford Heights, Ohio 44146

Filed Oct. 15, 1976, Ser. No. 732,757
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 16 Claims



1. An apparatus for mounting and securing a reel to the holder portion of a fishing rod having a rear holder portion comprising cavity means in said rear holder portion for receiving the base mounting plate of a reel, said cavity means having a top, bottom and side walls, cam means extending into said cavity means for urging the base mounting plate into abutment with said top wall of said cavity means thereby locking the reel to said rear holder portion, and means for varying the maximum extent of protrusion of said cam means into said cavity means when in the locked position to accommodate different sized reel base mounting plates.

4,084,344

TOY CONSTRUCTION SET

Kiyoji Asano, Tokyo, Japan, assignor to Shinsei Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1976, Ser. No. 666,440
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—28 1 Claim

1. A toy construction set, comprising:

a plurality of one-piece corner posts comprising:

a first group each comprising a leg, first and second groups

of two arms each extending outwardly from the ends of said leg, a locking cavity formed within the end of each of said arms, and a locking cavity formed within one end of said leg; and

a second group each comprising a leg, first and second groups of two arms each extending outwardly from an end and midportion of said leg, respectively, a locking cavity formed within the end of each of said arms, a locking cavity formed within said end of said leg, and a locking projection formed at the other end of said leg;

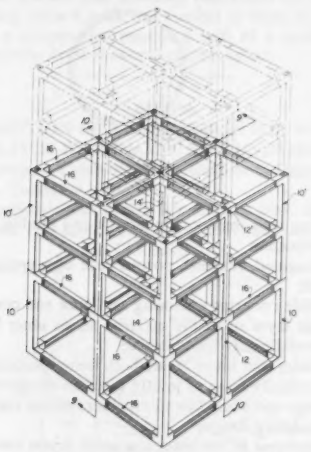
a plurality of one-piece middle post comprising:

a first group each comprising a leg, first and second groups of three arms each extending outwardly from the ends of said leg, a locking cavity formed within the end of each of said arms, and a locking cavity formed within one end of said leg;

a second group each comprising a leg, first and second groups of three arms each extending outwardly from an end and midportion of said leg, respectively, a locking cavity formed within the end of each of said arms, a locking cavity formed within said end of said leg, and a locking projection formed at the other end of said leg;

a plurality of one-piece center posts comprising:

a first group each comprising a leg, first and second groups of four arms each extending outwardly from the end of



said leg, a locking cavity formed within the end of each of said arms, and a locking cavity formed within one end of said leg;

a second group each comprising a leg, first and second groups of four arms each extending outwardly from an end and midportion of said leg, respectively, a locking cavity formed within the end of each of said arms, a locking cavity formed within said end of said leg, and a locking projection formed at the other end of said leg;

a plurality of one-piece beams terminating at each end thereof in locking projections;

said locking projections of said second group of said corner, middle and center posts, respectively, being complimentary in configuration with respect to said locking cavities of said legs of said first and second groups of said corner, middle and center posts, respectively; and

said locking projections of said beams being complimentary in configuration with respect to said locking cavities of said arms of said first and second groups of said corner, middle, and center posts, respectively;

said legs of said first and second groups of said corner, middle, and center posts being of uniform cross-sectional area between the respective groups of arms, and wherein said locking cavities of said legs of said first and second groups of said corner, middle and center posts are square in cross-section and wherein said locking projections of said second group of said corner, middle and center posts are square in cross-section enabling same to be fitted within said locking cavities of said legs of said first and second groups of said corner, middle and center posts;

said arms of said first and second groups of said corner, middle and center posts being rectangular in cross-section and of the same dimension, and wherein said locking cavities of said arms of said first and second groups of said corner, middle and center posts are rectangular in cross-section and said locking projections of said beams are rectangular in cross-section enabling same to be fitted within said locking cavities of said arms;

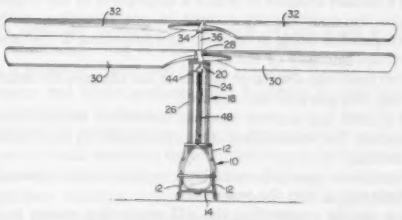
wherein certain of said locking cavities formed within the ends of said arms of said first and second groups of said corner, middle and center posts each comprise a first wall provided with an opening therein, a second wall spaced from said first wall and positioned opposite said opening in said first wall, and top and bottom walls connecting said first and second walls.

4,084,345

TOY HELICOPTER

Yutaka Tanaka, Urawa, Japan, assignor to Toytown Corporation, Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,682
Int. Cl.[2] A63H 27/12
U.S. Cl. 46—75 **1 Claim**



1. A toy helicopter, comprising:

a body provided with a supporting member in the vicinity of the bottom thereof, a shaft extending upwardly from said supporting member, and an opening at the top of said body which is generally circular in cross-section,

a generally rectangular frame having top, bottom and side connecting members, said bottom member having an opening therein through which said shaft of said body extends while said side members are spaced apart from each other a distance permitting said frame to rotate about said shaft and within said opening in said body, said top member having an opening therein, and a hook provided on one of said side members in the vicinity of the bottom thereof,

a wire spindle extending through said opening in said top member and provided with a hook at the lower end thereof,

a first hub fixedly secured to said top member of said frame and provided with an opening therein through which said spindle extends, a cylindrical housing positioned on top of said first hub and provided with an opening extending longitudinally therethrough through which said spindle extends, and a second hub positioned on top of said cylindrical housing and provided with an opening through which said spindle passes, the top of said spindle being fixedly secured to said second hub, such that said second hub rotates with said spindle,

a resilient band connecting said hook of said spindle and said hook provided on said side member,

a first wing operatively connected to said first hub to rotate with said first hub and frame, and

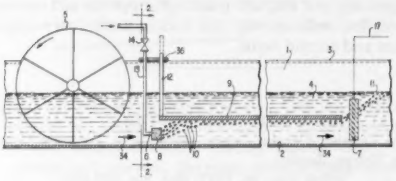
a second wing operatively connected to said second hub to rotate therewith, the pitch of said first and second wings being reversed.

4,084,346

METHOD AND ARRANGEMENT FOR OPTIMALLY SUPPLYING AUTOTROPHIC ORGANISMS WITH CO_2 NUTRIENT

Eberhard Stengel, Dortmund, and Carl Johannes Soeder, Dortmund-Brucherhof, both of Germany, assignors to Gesellschaft fur Strahlen- und Umweltforschung mbH, Munich, Germany

Filed Dec. 13, 1976, Ser. No. 749,893
Claims priority, application Germany, Dec. 13, 1975, 2556290
Int. Cl.² A01G 7/00
U.S. Cl. 47—1.4 **6 Claims**



1. Arrangement for optimally supplying autotrophic organisms with CO_2 nutrient comprising:

(a) a culture channel in which a suspension of the organisms can be continuously moved in one direction, with the suspension being in open air and subjected to fluctuations of the intensity of the sun;

(b) at least one discharge means in the channel for introducing CO_2 gas into the channel;

(c) at least one control member connected to the discharge means for controlling the operation of the discharge means;

(d) at least one pH measuring means in the channel for immersion into the suspension;

(e) a circuit connecting the pH measuring means and the control member to actuate the control member for introducing the CO_2 in response to the pH measured by the pH measuring means; and

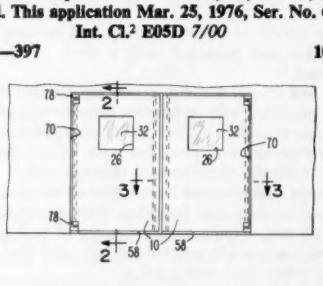
(f) a light transmitting, but gas impermeable barrier layer in parallel with the direction of flow of the suspension above and downstream of the CO_2 discharge means to hold the CO_2 discharged into the channel below the barrier layer and thereby prevent the CO_2 from immediately rising to the surface of the suspension.

4,084,347

HIGH IMPACT RESISTANCE DOOR

James W. Brown, 1612 Canyon Park Dr., Bend, Oreg. 97701

Continuation-in-part of Ser. No. 489,861, Jul. 19, 1974, abandoned. This application Mar. 25, 1976, Ser. No. 670,295
Int. Cl.² E05D 7/00
U.S. Cl. 49—397 **10 Claims**



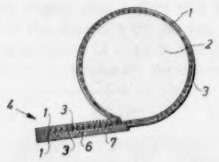
1. An industrial door adapted for use in environments which require the door to be subjected to impact forces exerted thereon comprising: a hollow body of a molded plastic material having the characteristic of being relatively highly resistant to an impact force exerted on the body, said body being formed from said material in a single molding process to present a pair of spaced vertical sidewalls, a top wall, a bottom wall and a pair of opposed vertical end walls interconnecting the top and bottom walls, the sidewalls, the top and bottom walls, and the end walls being integral with each other to present a monolithic construction for the body; a mass of applied-in-place insulating material within said body and bonded to the inner surfaces of said sidewalls and said top, bottom and end walls; and rod means embedded within said insulating material mass and spaced inwardly from said sidewalls and said end walls for reinforcing said body, there being means adjacent to one end wall for mounting hinge structure on the body, whereby the body can be swingably mounted on a door jamb.

4,084,348

SEALING STRIP

Gunnar Hast, Eknasvagen 4, 112 64 Stockholm, Sweden

Filed Mar. 29, 1977, Ser. No. 782,487
Claims priority, application Sweden, Mar. 29, 1976, 7603754
Int. Cl.² E06B 7/16
U.S. Cl. 49—475 **3 Claims**



1. A sealing strip for doors, windows and the like, comprising, in combination

(a) an elongated, resilient, porous core of a synthetic foam material;

(b) a flexible covering enclosing said core and consisting of an outer layer of textile material an an inner layer of a gas-proof, flexible foil material;

(c) said outer and inner layers both being prolongated circumferentially so as to jointly form an elongated mounting flange and being bound together only in the region of said mounting flange;

(d) the thickness of the outer and inner layers being dimensioned so as to permit resilient expansion of the core without substantial resistance from said layers while permitting sliding movement between those portions of said layers which enclose the core.

4,084,349

SHAPE GRINDER AND METHOD

John H. Farrell, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jul. 23, 1976, Ser. No. 707,947
Int. Cl.² B24B 7/02, 1/00
U.S. Cl. 51—5 D **6 Claims**

1. Grinding apparatus for forming noncircular punching tools comprising,

a grinding wheel having a cylindrical peripheral surface and rotable on a central grinding wheel axis,

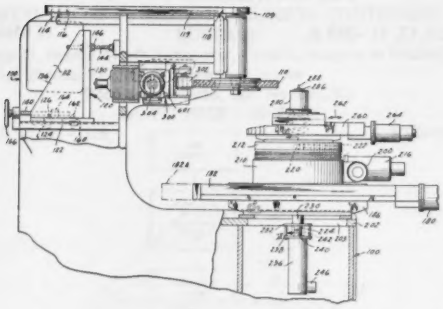
a first slide mounted for movement along a first axis toward and away from said peripheral surface of said grinding wheel and carrying a rotary table rotatable on a table axis parallel to said grinding wheel axis,

a second slide mounted on said rotary table and reciprocally movable along a second axis,

a third slide mounted on said second slide and reciprocally movable along a third axis disposed at right angles to said second axis, and having means for securing a tool blank

therewith with its tool axis parallel with said grinding wheel axis, and

drive means coupled with said slides and with said rotary table for moving a tool blank into grinding contact with said peripheral surface and for sequentially activating said second and third slides and said rotary table to progres-



sively remove material at four sides of said tool blank in succession in a grinding cycle and to advance the work further toward said grinding wheel and to repeat such grinding cycle a sufficient number of times to essentially form a noncircular punching tool of a predetermined noncircular cross sectional configuration.

4,084,350

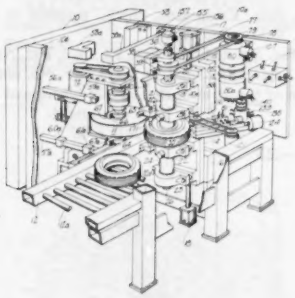
CORRECTION OF RUBBER TIRES FOR FORCES GENERATED BY DYNAMIC NON-UNIFORMITIES

Theodore Ongaro, Columbus, Ohio, assignor to Ongaro Dynamics, Ltd., Columbus, Ohio

Continuation-in-part of Ser. No. 525,011, Nov. 18, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,339

Int. Cl.[2] B24B *5/00*

U.S. Cl. 51—106 R **33 Claims**



1. The system for correcting an automobile rubber tire or the like for centrifugally generated non-uniformities comprising:

means for rotating the tire under load and at speeds in excess of 35 m.p.h. to generate centrifugal non-uniform areas of growth in said tire;

sensors means to sense the forces developed by the centrifugally generated non-uniform areas and to develop force signals having an amplitude and duration representative of the areas of non-uniform growth of the tire;

cutter means, and means to movably position said cutter means relative to the outside periphery of the tire;

signal control means responsive to said force signals operative to actuate said movable cutter positioning means to cause said cutter means to engage the tire in the areas of non-uniform growth as the tire is rotated at said centrifugal growth speed;

encoder means for developing a rotational reference position on the circumference of the tire, and mechanical means driven in timed relation to the rotational speed of the tire for correlating said rotational reference position with said force signals to accurately locate the positions on the tire of said areas of non-uniform growth.

4,084,351

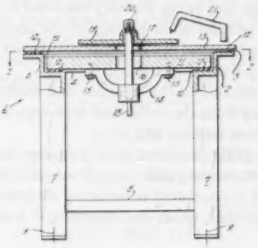
VIBRATION FREE DIAMOND POLISHING WORKBENCH

David Nicholas Lam, 217 N. Queens Ave., Massapequa, N.Y. 11758, and Stephen Joseph Lam, 34-35 76th St., Jackson Heights, N.Y. 11372

Filed Mar. 18, 1977, Ser. No. 778,843

Int. Cl.[2] B24B *41/06, 7/22;* **B28D** *5/00*

U.S. Cl. 51—109 R **9 Claims**



1. A diamond polishing workbench having a top working table substantially free of vibration comprising

(A) a frame of connected lateral members having common upper and lower surfaces, said members having interior and exterior surfaces,

(B) a step of predetermined height in the interior surface of each of said members thereby defining an interior ledge,

(C) a support means supported from said ledge and means to dampen vibration interposed between said support means and said ledge, said support means being out of direct contact with said frame,

(D) a work table seated on said upper surfaces of said lateral members and means to dampen vibration interposed between said work table and said upper surfaces, said work table being out of direct contact with said support means and said frame.

4,084,352

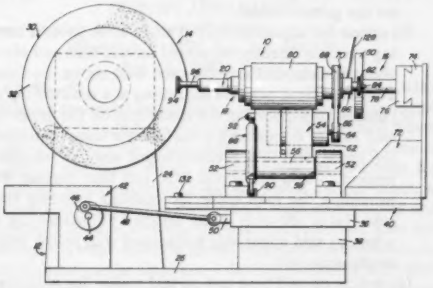
LAPIDARY MACHINE

Bradford J. Wheeler, P.O. Box 629, Lemmon, S. Dak. 57638

Filed Mar. 1, 1977, Ser. No. 773,151

Int. Cl.[2] B24B *17/02*

U.S. Cl. 51—127 **7 Claims**



1. A fluid-actuated chuck, comprising, in combination:

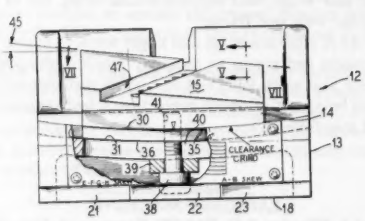
(a) a collet provided with a square hole for receiving a dopstick having a mating square shaft;
(b) a nose cap having front and rear openings and a through passage extending between the openings, the passage decreasing in diameter toward the front of the openings, with the collet being slidably disposed within the passage of the nose cap;
(c) a push rod connected to the collet and extending away from the rear of the opening of the nose cap, a cylinder connected to a source of fluid under pressure and connected to the nose cap, a piston connected to the push rod and normally biased away from the nose cap, the fluid under pressure moving the piston toward the nose cap and moving the collet toward the front of the openings of the nose cap, the collet being provided with a tapered nose including means for increasing the resiliency of the tapered nose and being matably received in the decreasing diameter portion of the passage of the nose cap in order to be clamped against the dopstick and retain the dopstick in the hole provided in the collet;
(d) a hub attached to the cylinder and extending longitudinally away from the collet and nose cap, the hub having a square cross section; and
(e) a stone guide provided with a square hole mating with the hub, the stone guide being removably mounted on the hub, with a consistent orientation thus being assured between the stone guide and dopstick.

4,084,353

SPADE DRILL SHARPENING FIXTURE

Reginald O. Schulz, and Larry R. Rivett, both of Bridgeport, Mich., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed May 6, 1976, Ser. No. 683,668
Int. Cl.² B24B *19/00*
U.S. Cl. 51—220 **9 Claims**



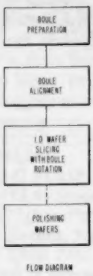
1. A fixture for holding spade drills on a reciprocable grinder table during grinding of the dip angle thereof, comprising:
(a) a base having a lower support surface for resting directly on the grinder table;
(b) means for adjusting the dip angle to be ground comprising a rocker directly supported on said base and pivotable about a horizontal axis disposed well above the fixture to a selected fixed position for setting at a selected dip angle;
(c) means for supporting the spade drill on the upper side of said rocker comprising a surface for directly supporting the spade drill in a predetermined angular relation with respect to said horizontal axis, and said angular relation providing the rake angle for enabling grinding the top-rake flat of the drill at the selected adjustable dip angle, whereby said upper side is disposed well below said horizontal axis; and
(d) indicia on said base and on said rocker for indicating the actual dip angle in fractional increments less than one degree for any setting of said rocker.

4,084,354

PROCESS FOR SLICING BOULES OF SINGLE CRYSTAL MATERIAL

Johannes Grandia, and John Charles Hill, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,082
Int. Cl.² B24B *1/02*
U.S. Cl. 51—283 R **10 Claims**



FLOW DIAGRAM

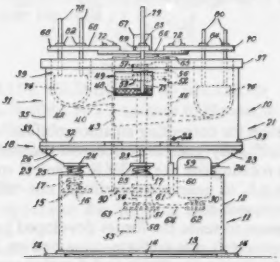
1. A method of slicing a boule of a hard single crystal material comprising the steps of
treating the surface of said boule to provide said boule with a longitudinal axis that is substantially the same as the crystallographic axis,
positioning said treated boule to have an orientation substantially perpendicular to an inner diameter rotatable saw blade,
rotating said boule about said longitudinal axis while maintaining said orientation, and
engaging said rotating boule against said rotating saw blade whereby a wafer is sliced from said boule.

4,084,355

FINISHING METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Division of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693.
This application May 14, 1976, Ser. No. 686,512
The portion of the term of this patent subsequent to Sep. 21, 1993, has been disclaimed.
Int. Cl.² B24B *1/00*
U.S. Cl. 51—313 **5 Claims**



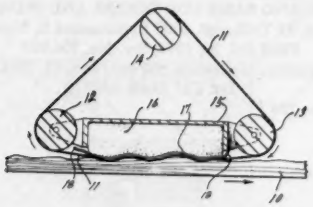
1. A process for finishing a part or parts in a finishing chamber by vibration together with loose finishing material including the step of imparting vibratory movement to said finishing chamber to cause parts contained therein to be finished by interaction with finishing material and to cause said parts and finishing material to move along said finishing chamber while maintaining said part or parts and finishing material in a compartment in said finishing chamber defined by part-isolating

means comprising a plurality, of partitions in said finishing chamber, characterized in moving said partitions along said finishing chamber by the movement of the contents of the compartment defined thereby.

4,084,356
METHOD OF FINISHING A RANDOM CONTOURED SURFACE

John H. Brears, North Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Jun. 1, 1976, Ser. No. 691,306
Int. Cl.[2] B24B *1/00, 21/08*
U.S. Cl. 51—328 **8 Claims**

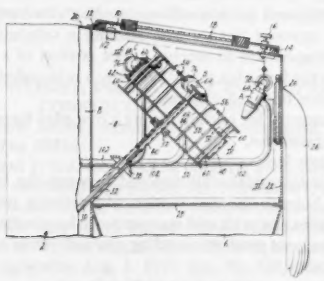


1. A method of finishing a longitudinally and transversely random contoured surface of a panelboard initially having a slippery surface with individual wood particles side by side on the surface comprising the steps of advancing a panelboard in contact with a sanding surface of a sanding belt, pressing a thin flexible membrane, deformable to follow the random contoured surface of the panelboard, with an even pressure onto a portion of the sanding belt to force the sanding surface to follow the random contoured surface of the panelboard and leaving a finished surface which is non-slippery, as compared to the panelboard's original surface.

4,084,357
VALVE CLEANING MACHINE

Robert W. Moses, Council Grove, Kans., assignor to Peterson Machine Tool, Inc., Merriam, Kans.

Filed Apr. 22, 1977, Ser. No. 789,787
Int. Cl.[2] B24C *3/22*
U.S. Cl. 51—419 **5 Claims**



1. A machine for cleaning valves of automotive engines, each valve comprising a flat circular head and an integral cylindrical stem projecting coaxially from said head, said machine comprising:

a. a cabinet,

b. a jet nozzle positioned within said cabinet and operable when actuated to eject a jet of air containing particles of abrasive material,

c. a carousel carried within said cabinet for rotation on its axis, said carousel comprising a generally cylindrical cage and having a circular pattern of holes formed therethrough, said holes being parallel to and equidistant from the cage axis, one end wall of said cage facing upwardly,

d. a support plate carried by said carousel beneath and parallel to the bottom of said cage, each of said valves being mountable in said carousel by slidably inserting its stem downwardly through one of the holes of the cage and resting it at its lower end on said support plate, with the valve head disposed in spaced relation above the top of the cage, said nozzle being directed toward the periphery of the circle of valve heads of the valves inserted in the carousel so as to be disposed in operative relation to the head of the closest of said valves, whereby as said carousel turns, all of said valve heads are presented successively in operative relation to said nozzle, said support plate being adjustably movable relative to said cage in a direction toward and from the lower end wall of said cage, whereby the length of the portions of the valve stems disposed between the valve heads and the upwardly facing end wall of the cage way be adjusted,

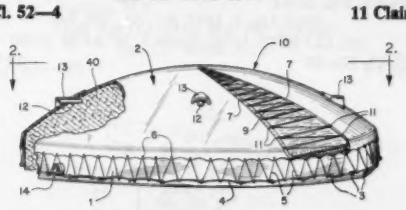
e. means operable to rotate said carousel, and

f. means operable to actuate said nozzle.

4,084,358
GRAIN STORAGE APPARATUS

Raymond S. Winters, La Grange, Ill., assignor to Environetics, Inc., Bridgeview, Ill.

Filed Sep. 23, 1976, Ser. No. 725,940
Int. Cl.[2] E04D *1/34*
U.S. Cl. 52—4 **11 Claims**



1. An improved storage apparatus of the type which includes a tarpaulin for covering a pile of dry material in bulk, wherein the improvement comprises:

a plurality of anchors for the tarpaulin, said anchors so positioned as to encircle the pile of dry material at spaced intervals,

a first cable attached to said anchors so as to define a circuit about the pile of dry material, and

flexible means for attaching a peripheral edge of said tarpaulin to said first cable at spaced intervals along the circuit of said first cable whereby the length of said flexible attaching means adjusts in response to stress exerted upon the tarpaulin.

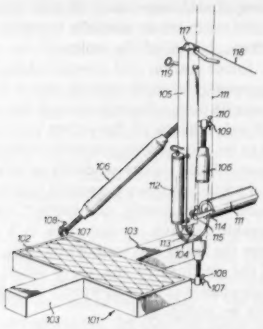
4,084,359
SURVEY APPARATUS

Thomas Bartlett Snell, Yeovil, England

Filed Oct. 7, 1975, Ser. No. 620,424
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—40 **2 Claims**

1. Survey apparatus comprising a base structure, a telescopic mast carriable by said base structure at a position which leaves the base structure with a substantial ballast supporting zone to one side of the mast, means for mounting an assembly for transmitting and/or receiving signals, visual and/or other, at the upper extremity of the mast, and a rigid mast staying and tilt adjusting linkage between the base structure and mast and including two transversely oriented lead screw mechanisms by which the mast can be tilted into a desired attitude in more than one vertical plane, the mast having a base support column and an extendable section, the base support column being mountable on the base structure and held in position by said linkage,

the extendable section being carried by said column, the bottom of the extendable section being pivotally attached to the



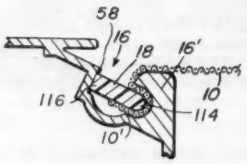
support column, and means on said column for drawing the extendable section up into an operative position with the extendable structure pivoting at its lower end.

4,084,360

COMBINATION SPLINE GROOVE

Harry Reckson, 2750 NE. 183 St., Apt. 2610, North Miami Beach, Fla. 33161

Filed Jun. 8, 1976, Ser. No. 693,797
Int. Cl.[2] E04B *1/343;* E06B *9/24;* A47H *13/00*
U.S. Cl. 52—63 12 Claims



1. In combination with an elongated structural body member (11 inter alia) such as a door stile (11) or window stile, which body member (11) forms at least a portion of a frame (11') over which a screening material (10) is retained, edge portions (10') of the screening material (10) being held within a spline groove (16) formed in the body member (11) by means of a spline strip (17, 18), the improvement comprising:

spaced first and second wall members (50, 52) formed in a planar wall (54) of the elongated body member (11), planar inner wall surfaces (56, 58) of the wall member (50, 52) being parallel and being disposed at an angle to an outer planar surface (60) of the planar wall (54), spaced parallel edges (62, 64) of outer ends (66, 68) of the wall members (50, 52) defining an elongated opening (70) therein, the second wall member (52) having a recess (72) formed longitudinally therein, the recess (72) being bounded by two spaced wall surfaces (74, 76), the planes of said wall surfaces (74, 76) near outer portions (78, 80) thereof being parallel and perpendicularly intersecting the plane of the inner wall surface (58) of the second wall member (52) to form first and second lateral edges (82, 84), the recess (72) further being bounded at innermost portions (86) thereof by an arcuate wall surface (88) formed essentially by inwardly curving inner portions (90, 92) of the two spaced wall surfaces (74, 76);

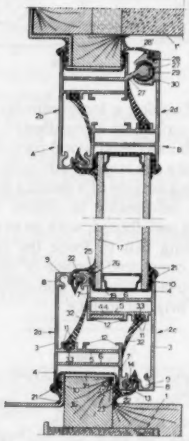
a recessed wall member (94) joined to inner ends (96, 98) of the first and second wall members (50, 52), the recessed wall member (94) having an arcuate recess (100) formed longitudinally therein, the arcuate recess (100) being bounded along a first lateral edge (102) thereof by a planar wall surface (104) of the recessed wall member (94), the plane of the wall surface (104) being perpendicular to the plane of the inner wall surface (56) of the first wall member (50), a second lateral edge (106) of the arcuate recess (100) being substantially coincidental with the second lateral edge (84) of the recess (72) formed in the second wall member (52), the first and second wall members (50, 52) and the recessed wall member (94) defining the spline groove (16) in the elongated body member (11), the spline groove (16) being capable of receiving into retaining relation with the edge portions (10') of the screening material (10) spline strips (17, 18) of varying axial cross-sectional configuration.

4,084,361

FRAME AND SASH FOR DOORS AND WINDOWS

Finn Aspaas, 19 Tollbodgt, 4600 Kristiansand S, Norway

Filed Jul. 20, 1976, Ser. No. 706,997
Claims priority, application Norway, Jan. 14, 1976, 760125
Int. Cl.[2] E06B *3/00*
U.S. Cl. 52—204 5 Claims



1. In a frame and sash for doors and windows, composed of similar profiled beams having a chair-shaped cross-section including:

(i) a chair-seat portion with protruding ribs having respective opposed flanges and defining a substantially dove tail-shaped slot to receive a foot portion of a lip-shaped strip the free edge portion of which is intended to contact another opposed such beam

(ii) a foremost leg portion having a free edge formed with an elongated slot,

(iii) a rear leg portion,

(iv) a longitudinal wall disposed between the leg portions and beneath the seat portion and defining with said leg portions and with said seat portion a longitudinal channel,

(v) a backrest portion extending upwardly from said rear leg portion,

the improvements that, in combination,

(a) the opening of said elongated slot is directed upwardly towards said seat portion and serves to receive a bead of a sealing gasket formed with elongated lips and disposed in said elongated slot and about the free edge of the rear leg portion and between said foremost leg and rear leg, said gasket forming a packing for the edge of a respective plate-shaped window pane and mounting ledge entering between said foremost leg and rear leg,

(b) the backrest portion has a greater height than the rear leg portion

(c) the seat portion is formed with a further pair of ribs having opposed facing flanges, and

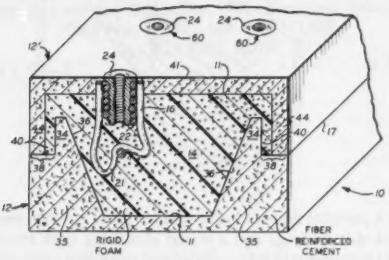
(d) the sides of the two leg portions facing each other are provided with parallel grooves to cooperate with ribs of said sealing gasket.

4,084,362

ANCHORED COMPOSITE BUILDING MODULE

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Filed Dec. 31, 1975, Ser. No. 645,850
Int. Cl.[2] E04B 1/60; E04C 1/40
U.S. Cl. 52—309.2 3 Claims



1. Composite building module comprising a rigid foam core encased in an enclosed shell made of fiber reinforced cement having at least one aperture therethrough and at least one anchor means each extending through only one wall through one aperture for attaching said module to a supporting structure having an anchoring portion extending through the aperture in said one wall of said shell and an interlocking portion having an attaching portion attached to the anchoring portion along the length thereof and an extending portion extending radially outwardly from the periphery of the anchoring portion and into said foam core, wherein each aperture decreases in size towards the exterior of the shell to closely receive only the anchoring portion at the exterior of the shell and to provide a clearance between the remaining shell wall and anchoring portion to receive the anchoring portion and the attaching portion of the interlocking portion, said foam core being formed within the enclosed shell filling the interior thereof and enveloping at least the interlocking portion of the anchor means and coacting with the interlocking portion in conjunction with the blocking effected by the decreased aperture size at the exterior of the shell to resist removal of the anchor means in response to an outwardly directed force thereon.

4,084,363

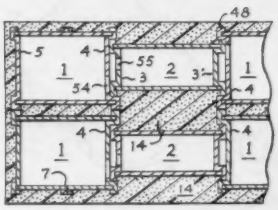
LIGHT-WEIGHT, INSULATED, CAN-COMPRISING CONSTRUCTION MEMBER

Alvin Edward Moore, Manini Way, Diamondhead, Bay St. Louis, Miss. 39520

Continuation of Ser. No. 714,613, Aug. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 543,661, Jan. 24, 1975, Pat. No. 3,979,870, which is a continuation-in-part of Ser. No. 359,800, May 14, 1973, Pat. No. 3,878,661, which is a continuation of Ser. No. 102,317, Dec. 29, 1970, abandoned. This application Aug. 1, 1977, Ser. No. 820,606
Int. Cl.[2] E04B 1/00, 1/74
U.S. Cl. 52—309.4 29 Claims

1. A construction member, adapted for assembly with other elements of a composite structure, including:

a bundle comprising a plurality of at least three rows of end-joined cans, assembled around an interior line of the member, said line being within a cavity between and surrounded by sidewall portions of cans of said plurality of rows, the axes of said rows of cans being grouped thru three hundred and sixty degrees around said line; each of said cans having row-strengthening can ends, one of said ends being an imperforate can-end cap; each of said rows having a said imperforate can-end cap at each of its ends and including a plurality of row-strengthening joints between abutting pairs of can ends; each of said joints including: a can-end cap of one can of an adjacent pair of



cans; a can end of the other of said pair of cans, abutting said last-named can-end cap; and connecting means fastening together said abutting can-end cap and can end; and

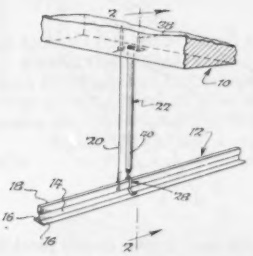
tie elements surrounding said bundle, contacting can sidewalls of said rows of cans, holding said rows assembled in said bundle.

4,084,364

COMPRESSION STRUT FOR SUSPENDED CEILING

Donald P. Jones, Lockeford, Calif., assignor to Roblin Industries, Inc., Buffalo, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,706
Int. Cl.[2] E04B 5/52
U.S. Cl. 52—484 9 Claims



1. The combination of a suspended ceiling grid system and an overhead structural framework extending thereabove from which said grid system is supportably suspended by a plurality of hanger means, and at least one compression strut extending between said grid system and said overhead framework, said compression strut including freely resilient spring means whereby said strut presses downwardly on said grid system in a resilient manner so that the latter resists upward movement at all times.

4,084,365

ONE-PIECE ROOFING TILE

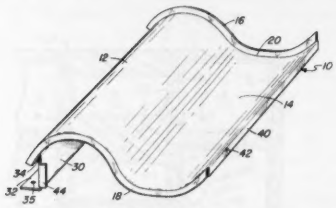
John Cecil Read, 1252 La Jolla Rancho Rd., La Jolla, Calif. 92037

Filed Feb. 18, 1977, Ser. No. 769,896
Int. Cl.[2] E04D 1/00
U.S. Cl. 52—529 6 Claims

1. A one piece roofing tile structure comprising:

a relatively thin sheet material shaped to define a double convoluted panel having an upslope end defined by an upturned vertically extending flange of said sheet, a downslope end spaced from the upslope end defined by a downturned flange, and generally parallel first and second side edges,

one of said side edges defined by an overlapping overhang defined by a return fold of said sheet material and a vertical support wall defined by a downward fold of said sheet material defining a locking channel therebetween, and



connecting flange on the foot of said wall extending outwardly at a right angle to said wall,

the other of said side edges defining locking means for engaging into a locking channel of an adjacent tile.

4,084,366

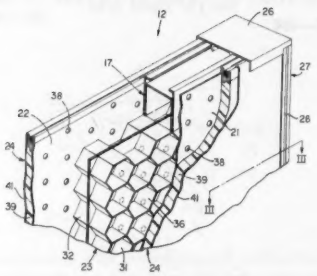
SOUND ABSORBING PANEL

Charles J. Saylor, Zeeland; Richard G. Haworth, Holland, both of Mich., and Lyle F. Yerges, Downers Grove, Ill., assignors to Haworth Mfg., Inc., Holland, Mich.

Filed Nov. 14, 1975, Ser. No. 631,855

Int. Cl.² E04B *2/28*

U.S. Cl. 52—615 **23 Claims**



1. In a portable interior space divider panel having opposed enlarged side surfaces and a sound absorbing core structure disposed between said side surfaces and extending substantially coextensively over the area thereof, comprising the improvement wherein said core structure includes first means for absorbing sound waves of lower frequency and second means for absorbing sound waves of substantially higher frequency, one of said sound absorbing means including a plurality of Helmholtz resonators each defined by a small substantially closed chamber disposed interiorly of the wall panel and communicating with the surrounding environment through small opening means which projects outwardly from the respective chamber toward one of the side surfaces of the panel, said plurality of Helmholtz resonators including pluralities of first and second resonators of different size for absorbing sound waves of different frequency, each said first resonator being defined by a first interior chamber which is substantially closed except for first opening means which extends through the side surface of the panel and provides communication between said first chamber and the surrounding environment, each said second resonator being defined by a second interior chamber which is substantially closed and communicates with the surrounding environment through second opening means which extends through the side surface of the panel, and the other sound absorbing means comprising a layer of porous sound absorbing material which overlies said plurality of Helmholtz resonators and is substantially coextensive therewith.

4,084,367

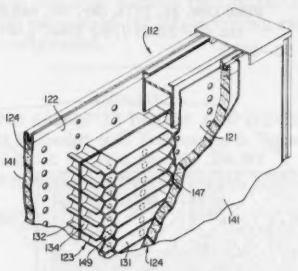
SOUND ABSORBING PANEL

Charles J. Saylor, Zeeland; Richard G. Haworth, Holland, both of Mich., and Lyle F. Yerges, Downers Grove, Ill., assignors to Haworth Mfg., Inc., Holland, Mich.

Continuation-in-part of Ser. No. 631,855, Nov. 14, 1975. This application Jan. 24, 1977, Ser. No. 761,777

Int. Cl.² E04B *2/28*

U.S. Cl. 52—615 **11 Claims**



1. In a portable interior space divider panel having opposed enlarged side surfaces and a sound absorbing core structure disposed between said side surfaces and extending substantially coextensively over the area thereof, comprising the improvement wherein said core structure includes first means for absorbing sound waves of lower frequency and second means for absorbing sound waves of substantially higher frequency, one of said sound absorbing means including a plurality of Helmholtz resonators each defined by a small substantially closed chamber disposed interiorly of the wall panel and communicating with the surrounding environment through small opening means which projects outwardly from the respective chamber toward one of the side surfaces of the panel, said plurality of Helmholtz resonators including pluralities of first and second resonators of different size for absorbing sound waves of different frequency, each said first resonator being defined by a first interior chamber which is substantially closed except for first opening means which extends through the side surface of the panel and provides communication between said first chamber and the surrounding environment, each said second resonator being defined by a second interior chamber which is substantially closed and communicates with the surrounding environment through second opening means which extends through the side surface of the panel, and said first opening means being of substantially greater cross-sectional area than said second opening means.

4,084,368

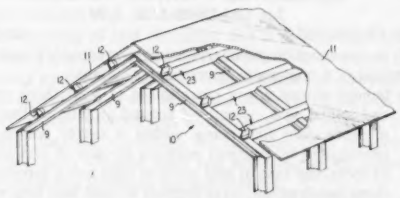
APPARATUS FOR INSULATING PURLINS

Kenneth Morris Stilts, P.O. Box 17087, Nashville Tenn. 37217

Filed Jan. 23, 1976, Ser. No. 651,958

Int. Cl.² E04C *3/30, 1/34*

U.S. Cl. 52—728 **13 Claims**



1. A purlin insulated to reduce heat transfer from outside of

a building into the building and from inside the building to outside of the building, said purlin including:

a blanket of flexible thermal insulating material folded around the purlin; and

a sleeve of thin flexible material surrounding the blanket to hold the blanket in place on the purlin.

4,084,369

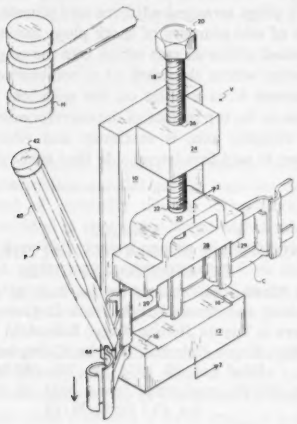
CHAIN LINK ASSEMBLY AND DISASSEMBLY TOOL

Herman E. Luebbers, Rte. 1, Box 194C, Randolph, Nebr. 68771

Filed May 2, 1977, Ser. No. 792,689

Int. Cl.[2] B21L *21/00*

U.S. Cl. 59—7 **4 Claims**



1. A chain link disassembly and assembly apparatus for use with detachable sprocket chains of the type with links which include a generally rectangular shaped frame with a male end or pintle and an open-sided female end or sleeve at the other end, the pintle of one link being received and the sleeve of an adjoining link to connect the two, said apparatus comprising:

(a) a vise means including:

(i) a base member with an upstanding bucking block at one end thereof;

(ii) a support block having a threaded opening therein secured to said base toward the other end thereof from said bucking block and receiving a theaded rod therein;

(iii) a movable vise jaw loosely mounted on said threaded rod and movable toward and away from said bucking block responsive to a turning movement of said rod to effect a clamping action on the portion of said sprocket chain placed therebetween;

(b) an impact punch having a large and a smaller end, a slot extending transversely across the smaller end forming a groove therein with a base wall and a pair of side walls, the distance between said side walls being substantially the same or slightly greater than the thickness of the material forming the links of said chain; and

(c) whereby when the link chain is secured within said vise and the impact punch assembled onto the edge and closely adjacent the male end or pintle of the nearest chain link adjacent the vise said nearest chain link may be twisted to align the pintle thereof with the sleeve of the clamped adjacent link, sharp impact blows applied to the large end of said impact punch will dislodge the two links.

4,084,370

APPARATUS FOR FASTENING A COVERING ON AN ENERGY CONDUCTING CHAIN

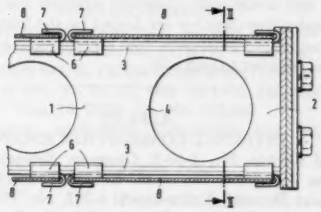
Werner Moritz, Siegen, Germany, assignor to Kabelschlepp Gesellschaft mit beschrankter Haftung, Siegen, Germany

Filed Jun. 30, 1977, Ser. No. 811,611

Claims priority, application Germany, Aug. 5, 1976, 7624583[U]

Int. Cl.[2] F16G *13/16*

U.S. Cl. 59—78.1 **6 Claims**



1. An apparatus for fastening a cover made of steel band or the like on an energy conducting chain, the latter being formed of two link chains and webs of at least one piece connecting the latter with one another, comprising

a web having an upper belt and a lower belt,

said upper belt and said lower belt each being formed with lateral grooves,

clasp means for securing a steel band therein, respectively, said clasp means including lateral clamps cooperating with said grooves, said clasp means engaging in said grooves.

4,084,371

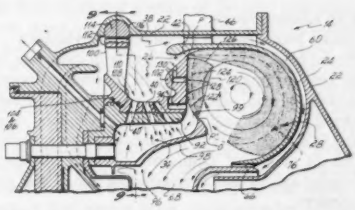
COMBUSTION APPARATUS INCLUDING AN AIR-FUEL PREMIXING CHAMBER

Werner E. Howald, 5970 Crabtree La., Cincinnati, Ohio 45243

Continuation of Ser. No. 491,611, Jul. 24, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,326

Int. Cl.[2] F02C *7/22*

U.S. Cl. 60—39.36 **11 Claims**



1. A combustor for generating a hot gas stream by the combustion of a pressurized, premixed air-fuel stream, said combustor comprising:

a housing;

an arcuate combustor liner and baffle mounted within said housing and defining a generally toroidal-shaped combustion chamber;

an air inlet orifice adjacent to the outer periphery of said combustion chamber providing for the entry of a main pressurized airstream thereto;

an air-fuel premixing chamber having an upstream end and a downstream orifice opening into said combustion chamber;

means for injecting fuel into said premixing chamber at said upstream end thereof;

an air inlet plenum chamber formed by said housing and said baffle;

means interconnecting said plenum chamber with said pre-

mixing chamber, whereby pressurized air flows from said plenum chamber into said premixing chamber to form a substantially homogeneous vapor-phase air-fuel mixture in said premixing chamber;

the downstream orifice of said premixing chamber being spaced from said air inlet orifice, whereby said pressurized air-fuel premixture is introduced into said main airstream adjacent to said air inlet orifice;

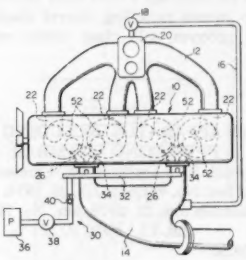
said housing having a circumferential exit formed therein spaced downstream of said liner, said liner presenting a concave surface disposed transversely of the flow of gases in said combustion chamber, whereby the gases in said combustion chamber are forced by the liner to flow in a generally toroidal path from said premixing chamber and said air inlet to said exit.

4,084,372

INTERNAL COMBUSTION ENGINE

Hiroshi Kuroda, No. 2-40-3, Okusawa, Setagaya-ku, Tokyo; Yasuo Nakajima, No. 1-16, Kubiri, Yokosuka City; Yoshimasa Hayashi, Kuden-danchi 4-201, No. 740, Kuden-cho, Totsuka-ku, Yokohama City; Kunihiko Sugihara, No. 1-9-9, Morigaoka, Isogo-ku, Yokohoma City, and Yasuo Takagi, No. 1757-70, Kamigo-cho, Totsuka-ku, Yokohama City, all of Japan

Filed Jun. 16, 1976, Ser. No. 696,707
Claims priority, application Japan, Jun. 24, 1975, 50-78351
Int. Cl.[2] F01N *3/10*; F02M *25/06*
U.S. Cl. 60—278 **4 Claims**



1. In an engine system:

a cylinder block having a plurality of cylinders;

a cylinder head closing said plurality of cylinders, said cylinder head having a plurality of recesses corresponding in number to said plurality of cylinders, said recesses arranged to close said plurality of cylinders, respectively, each of said plurality of recesses having a spherical surface with its center of radius of curvature disposed on the cylinder axis of the corresponding one of said plurality of cylinders,

said cylinder head having a first lateral side and a second lateral side opposite to said first lateral side, having a plurality of intake port bores, each extending from an inlet port within said first lateral side inwardly toward an intake valve port of adjacent one of said cylinders, and having a plurality of exhaust port bores, each extending from an outlet port within said second lateral side inwardly toward at least one of exhaust valve ports of said plurality of cylinders;

a plurality of pistons reciprocally disposed in said plurality of cylinders, respectively, each of said plurality of pistons having a top surface having a non-squish area coextending with the shadow of said spherical surface of the corresponding one of said plurality of recesses which is projected along the cylinder axis, each of said top surfaces having a squish area around and outside of the non-squish area thereof;

an intake manifold disposed on one side of said cylinder head and connected to said inlet ports within said first lateral side of said cylinder head;

an exhaust manifold disposed on the opposite side of said cylinder head and connected to said outlet ports within said second lateral side of said cylinder head;

each of said intake vaive ports being offset from a transverse plane passing through the cylinder axis of the corresponding one of said plurality of cylinders in a direction along a longitudinal axis of said cylinder head, said transverse planes being perpendicular to said longitudinal axis of said cylinder head, and said intake valve ports being offset from the cylinder axis of the corresponding one of said plurality of cylinders toward said first lateral side of said cylinder head;

means for introducing a portion of exhaust gases within said exhaust manifold into said plurality of cylinders through their respective intake valve ports;

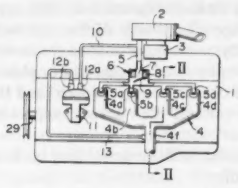
ignition means for causing combustion within said plurality of cylinders, said ignition means comprising a plurality of spark plugs arranged adjacent said plurality of cylinders, each of said plurality of spark plugs having its electrode disposed within an area which is in the neighborhood of a location where thickness of a combustion chamber, as measured from a point on the spherical surface of the recess to the top surface of the corresponding piston along the cylinder axis, is maximum and which is disposed nearer to said first lateral side than said cylinder axis.

4,084,373

SECONDARY AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masanao Hashimoto; Tadashi Saitou, both of Toyota; Tatsuo Kobayashi, and Isamu Suzuki, both of Oobu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Oobu, both of, Japan

Filed Jun. 23, 1976, Ser. No. 698,960
Claims priority, application Japan, Mar. 18, 1976, 51-29628
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—293 **8 Claims**



4. A secondary air supply system for an internal combustion engine having an output shaft and exhaust manifolds, comprising:

a first air supply system including an air passage means having an upstream end opened to the atmosphere and a downstream end connected to the exhaust manifold of the engine;

a reed check valve provided in said air passage means for allowing air to flow only from said upstream end towards said downstream end;

a second air supply system including an air pump having an air delivery port;

a mechanical driving connection for driving said air pump from the output shaft of the engine at a speed proportional to that of the rotational speed of the output shaft;

an air conduit means connecting said air delivery port of said air pump to the exhaust manifold of the engine; and

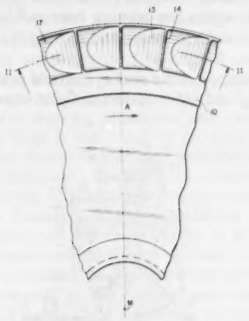
said air conduit means being a direct conduit and free of control valve means positioned therein.

4,084,374

HYDRODYNAMIC COUPLING

Robert Schlitz, Tettnang, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Feb. 16, 1977, Ser. No. 769,201
Claims priority, application Germany, Feb. 18, 1976, 2606430
Int. Cl.² F16D 33/00
U.S. Cl. 60—330 7 Claims



1. In a hydrodynamic coupling comprising two coaxial wheels with confronting annular gorges together defining a toroidal channel of generally circular cross-section, each wheel being provided in its annular gorge with a multiplicity of blades tilted forwardly in its direction of rotation relative to the other wheel, each blade having a leading flank and a trailing flank converging at a free edge proximal to the opposite wheel, said free edge lying in a plane transverse to the axis of rotation,

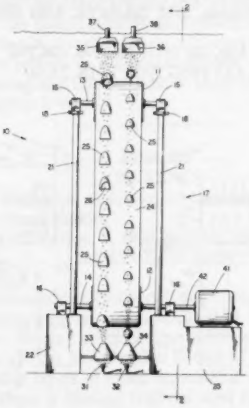
the improvement wherein said leading and trailing flanks are planar and include with each other a vertex angle in a range of substantially 15° to 20°, said leading flank including with the axial direction a mean angle in a range of substantially 35° to 45°.

4,084,375

METHOD AND APPARATUS FOR GENERATING BUOYANCY POWER VIA ELECTROLYSIS

Janos Horvath, R.R. 1, Box 44, Martinsville, Ind. 46151

Filed Mar. 3, 1977, Ser. No. 774,196
Int. Cl.² E02B 9/08; F03B 13/12
U.S. Cl. 60—496 11 Claims



1. A buoyancy power-generating device comprising:

(a) means for electrolytically generating hydrogen and oxygen gases under water;

(b) means positioned between said means for generating and the water surface for separately harnessing the buoyant energy contained in the rising hydrogen and oxygen gas bubbles;

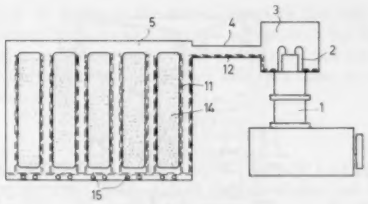
(c) and means for separately collecting the hydrogen and oxygen gases for later use.

4,084,376

HEATING SYSTEM

George Albert Apolonia Asselman; Herman Henricus Maria Van der AA, and Roelf Jan Meijer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 81,337, Oct. 16, 1970. This application Jun. 14, 1972, Ser. No. 262,665
Claims priority, application Netherlands, Oct. 30, 1969, 6916336
Int. Cl.² F02G 1/04
U.S. Cl. 60—523 7 Claims



7. In combination a hot-gas engine operable with a primary heat source, the engine including a heater part and a heating means for said heater part formed as a heat-pipe comprising a heat discharging portion in which at least, a part of said heater part is situated, a heat-receiving portion for receiving heat from said primary heat source, and a duct connecting said two portions, heat-transporting, vaporizable liquid medium in said heat pipe, a continuous first capillary layer on inner surfaces of said heat pipe for conducting condensate from the heater to said heat-receiving portion, and a secondary heat source within said heat-receiving portion of the heat pipe comprising at least one inner container containing a heat-accumulating, meltable solid material and a second capillary layer thereon communicating with said first capillary layer, said secondary heat source operable to provide heat to said heat transporting-liquid medium in said heat-receiving portion of the heat pipe independent of heat from said primary heat source, whereby when heat is conducted from the primary heat source to said heat-receiving portion, said liquid medium vaporizes, and flows to, condenses on, and transmits heat to said heater and to said secondary heat source inner container wherein said heat-accumulating material becomes melted, said condensate forming on said heater in said heat-discharging region flowing via said capillary layers to said heat-receiving portion, for re-evaporation.

4,084,377

BRAKE SYSTEM FAILURE CONDITION INDICATOR

Robert F. Gaiser, Stevensville, Mich., assignor to The Bendix Corporation, South Bend, Ind.

Filed Nov. 5, 1976, Ser. No. 739,240
Int. Cl.² B60T 11/20
U.S. Cl. 60—535 5 Claims

1. A master cylinder comprising:

a housing having a reservoir connected to a first bore and second bore located therein, said first bore being connected to said second bore;

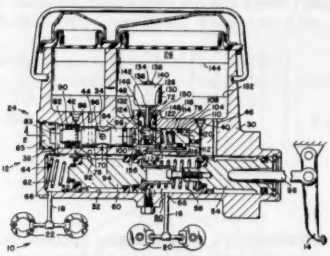
fluid level responsive means for controlling the communication of fluid between said reservoir and second bore, said

fluid level responsive means including a fleat, a stem and a valve, said float being located in said reservoir, said stem extending from said float into said second bore, said valve being attached to said stem and located in said second bore, said float holding said valve against a seat when the fluid in said reservoir is above a predetermined level;

a first operational piston located in said first bore;

a second operational piston located in said first bore, said first and second operational pistons defining a first power chamber therebetween and a second power chamber between said second operational piston and a closed wall of said first bore, said first and second operational pistons initially responding to an input force for interrupting communication of fluid beween said reservoir and said first and second power chambers and thereafter pressurizing the fluid in the first and second power chambers to produce first and second fluid output signals which are communicated to said second bore;

shuttle piston means including a first spool, a sleeve and a second spool located in said second bore, said first spool having a first diameter separated from a second diameter by a shoulder, said first spool having a groove located in



said second diameter, said sleeve surrounding said first diameter of said first spool, said first fluid output signal acting on said sleeve and said first diameter of the spool to position said groove adjacent a switch means, said second spool being separated from said first spool to establish a fluid actuation chamber in said second bore, said valve of the fluid level responsive means being located in said fluid actuation chamber, said float holding said valve means against its seat to allow said second fluid output signal to act on the second spool and pressurize fluid in said actuation chamber to maintain the first spool in stationary position; and

said switch means being responsive to movement of said shuttle piston means for informing an operator of a fluid condition resulting from a pressure differential across said shuttle piston means, said pressure differential occurring in a first condition whenever a predetermined fluid level in said reservoir moves said fluid level responsive means and permits fluid communication between the second bore and said reservoir and in a second condition whenever a differential pressure exists across the second operational piston.

4,084,378

WASTE GATE CONTROL FOR SUPERCHARGED ENGINES

William J. Blake, Rte. 1, Box 403, Muskogee, Okla. 74401

Filed Sep. 1, 1976, Ser. No. 719,882
Int. Cl.² F03B 23/00
U.S. Cl. 60—602 **4 Claims**

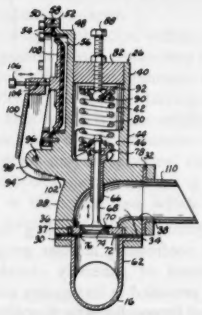
1. A waste gate for an internal combustion engine having an exhaust gas driven supercharger interposed in its exhaust gas pipe supplying air under pressure greater than atmospheric to the engine intake manifold, comprising:

a housing having a base portion provided with a passageway therethrough forming an inlet port and an outlet port, said housing having a hollow cylindrical portion and having a transversely apertured web securing said cylindrical portion to said base in spaced-apart relation coaxial with the inlet port;

means connecting said base with the exhaust gas pipe upstream with respect to the location of said supercharger for exhaust gas communication with the passageway, said base having a bore coaxial with the inlet port;

a valve having one end portion of its stem disposed between said base and said cylindrical portion and slidable intermediate its ends within the housing bore and having a head including a seat for opening and closing the passageway inlet port;

spring means supported by said cylindrical portion for normally biasing said valve to an inlet port closed position;



a substantially dish-shaped diaphragm support formed on said cylindrical portion;

a diaphragm overlying and secured by its marginal edge portion to the marginal edge portion of said support for forming a chamber remote from said valve and said spring means;

tubular means connecting the chamber with said intake manifold,

said diaphragm being movable in one direction in response to an increased intake manifold pressure; and,

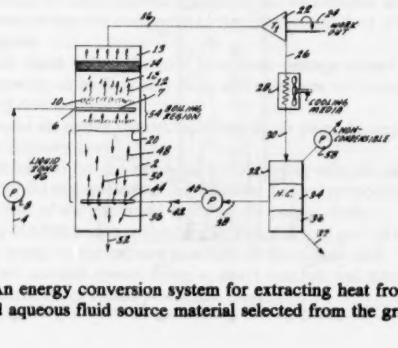
lever means pivotally supported by said housing and operatively contacted by said spring means for normally biasing said diaphragm in an opposite direction in response to a decrease in intake manifold pressure.

4,084,379

ENERGY CONVERSION SYSTEM

Everett H. Schwartzman, 2751 Toledo St., Unit 309, Torrance, Calif. 90503

Filed Aug. 22, 1975, Ser. No. 606,790
Int. Cl.² F03G 7/00; F01K 25/00
U.S. Cl. 60—641 **22 Claims**



1. An energy conversion system for extracting heat from a heated aqueous fluid source material selected from the group

consisting of geothermal and solar heated source fluids, and waste heat water solutions from power plants and industrial processes, which may contain dissolved solutes therein, comprising the steps of:

introducing a working fluid and said heated fluid source material into a vessel to effect contact therebetween for effecting direct heat transfer from said heated fluid source material to said working fluid whereby the combined vapor pressure of the heated aqueous source material and of working fluid being equal to the working pressure in the vessel thereby to effect boiling of the mixture of heated aqueous fluid source material and the working fluid, the temperature of boiling of said mixture being lower than the individual boiling points of each of the heated aqueous fluid source material and of the working fluid at the working pressure of said vessel such that said working fluid is vaporized to produce a vapor effluent while said heated fluid source material is cooled,

effecting substantially unobstructed counter current flow of said working fluid and said heated aqueous fluid source material through said vessel to inhibit and to minimize precipitation of dissolved solutes in said vessel as said heated aqueous fluid source material is cooled and preventing accumulation of precipitated solids from said fluid source material on the walls of said vessel by flowing a portion of the working fluid along the walls of said vessel,

said working fluid being immiscible with said heated fluid source material,

withdrawing said cooled fluid source material from said vessel,

condensing the working vapor from said vessel into a working liquid, and

recirculating said condensed working liquid to effect introduction of the formed working liquid into said vessel on a continuous basis.

9. A method of generating power from a heated aqueous fluid source material selected from the group consisting of geothermal and solar heated source fluids, and waste heat water solutions from power plants and industrial processes, which may contain dissolved solutes therein, comprising the steps of:

bringing a transfer fluid into direct heat transfer relationship with the heated fluid source material to effect transfer of heat from said source material to said transfer fluid,

bringing said transfer fluid into direct heat transfer relationship with a working fluid to effect transfer of heat to said working fluid to vaporize the working fluid to form a working vapor effluent,

said step of direct heat transfer from said transfer fluid to said working fluid being conducted in a third fluid in which at least said working fluid is substantially insoluble so as to prevent loss of at least said working fluid,

condensing said vapor effluent to a working liquid after said vapor has passed through said power extracting device,

pressurizing and recirculating said working liquid to carry out the process on a continuous basis, and

recirculating said transfer fluid to carry out the process on a continuous basis.

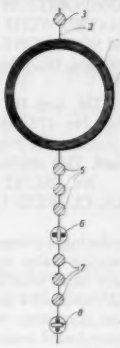
4,084,380

OIL FENCE

Rudolf G. Hallhagen, Goteborg, Sweden, assignor to AB Sjuntorp, Sjuntorp, Sweden

Filed Jun. 3, 1976, Ser. No. 692,282
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **5 Claims**

1. Oil fence adapted for the defining of impurities on a water surface, comprising an elongated web of preferably impregnated fabric forming a first portion stretching in the longitudinal direction of the web at a first border of the same and comprising double layers of fabric separated from each other and extending about a floating body, at least one second portion stretching in the longitudinal direction of the web at a second border of the same and comprising separate double layers of fabric and containing sinking weights, and at least one third portion between the first and the second portions comprising a single layer of fabric, said fabric being a woven textile material in one single piece forming said double and single layers, the



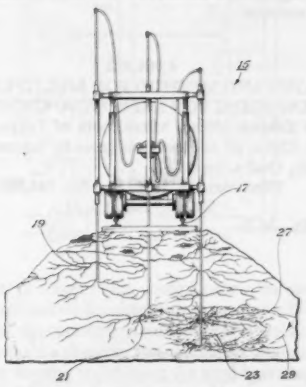
threads weft of which in the double layers of the first and second portions being divided into two groups, each one forming one layer and in the single layer of the third portion the threads of the weft being interwoven with each other to form an integrated single layer.

4,084,381

STABILIZATION OF EARTH SUBSURFACE LAYERS

Gene Cain; Joe Doyle Teague, both of Fort Worth, and Paul James Wright, Euless, all of Tex., assignors to Woodbine Corporation, Fort Worth, Tex.

Filed Jan. 19, 1977, Ser. No. 760,454
Int. Cl.[2] E02D *3/14*; E01B *1/00*
U.S. Cl. 61—36 C **15 Claims**



1. A method of treating sub-surface layers of the earth for controlling movement of sub-surface water and building strength of said sub-surface layers comprising injecting at a plurality of predetermined depths and at a plurality of predetermined, spaced-apart locations a lime-fly ash slurry consisting essentially of water, particulate hydrated lime, particulate fly ash and surfactant; said particulate lime and fly ash being present as particulate solids in a proportion within the range of 25–60 percent by weight of said water; said particulate solids comprising lime in a proportion of 25–50 percent by weight and fly ash in a proportion of 75–50 per cent by weight; and said surfactant being present in a concentration within the range of 0.01–1 percent by volume; such that said sub-surface layers are treated insitu to obtain additional strength and to obtain stabilized moisture content without requiring removal,

admixture into homogeneous mass, replacement, and compaction.

4,084,382

METHOD AND COMPOSITION FOR PREVENTING WATER CONTAMINATED WITH INDUSTRIAL WASTE SEEPING THROUGH SOIL CONTAINING SAID WATER

Arthur G. Clem, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

Division of Ser. No. 605,234, Aug. 18, 1975, Pat. No. 4,021,402, which is a division of Ser. No. 472,668, May 23, 1974, Pat. No. 3,949,560, which is a continuation-in-part of Ser. No. 330,200, Feb. 27, 1973, abandoned. This application Dec. 23, 1976, Ser. No. 753,712

Int. Cl.² E02D 3/12

U.S. Cl. 61—36 R 6 Claims

1. A method for producing a composition useful in forming an enclosure for containing water contaminated with water-soluble industrial waste salts which comprises forming an intimate admixture of dry soil and a sealing effective amount of soil sealant composition consisting essentially of an intimate dry admixture of (a) unhydrated bentonite; (b) a water-soluble dispersing agent selected from the group consisting of a water-soluble salt of phosphoric acid, a water-soluble sulfate of the formula $ROSO_3X$ where R is hydrocarbon of from 8 to 32 carbon atoms, and X is a member selected from the group consisting of an alkaline metal or ammonium, and a water-soluble salt of leonardite; and, (c) a water-soluble polymer selected from the group consisting of polyacrylic acid, water-soluble salts of polyarcylic acid, hydrolyzed poly-acrylonitrile, polyvinyl acetate, polyvinyl alcohol, copolymers of the foregoing, and a copolymer of acrylic acid and maleic anhydride, the amount of water-soluble polymer in said soil sealant composition being from 0.1% to 3.0%, by weight, the weight ratio of water-soluble dispersent to water-soluble polymer being from 6:1–36;

and contacting the resulting dry mixture of soil and soil sealant composition with water containing substantially no water-soluble industrial waste salts thereby hydrating the bentonite.

4,084,383

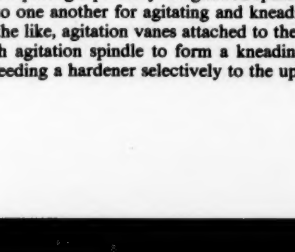
APPARATUS AND METHOD FOR MULTIPLE SPINDLE KNEADING FOR IMPROVING GROUND

Yoshinori Kukino; Mitsuo Miura, both of Tokyo, and Hayao Aoyagi, Chiba, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Nov. 26, 1976, Ser. No. 744,990

Int. Cl.² E02D 3/12

U.S. Cl. 61—36 R 11 Claims



1. A method for improving ground by using a kneading apparatus comprising a plurality of agitation spindles disposed in parallel to one another for agitating and kneading soft soil layers and the like, agitation vanes attached to the lower portion of each agitation spindle to form a kneading zone and means for feeding a hardener selectively to the upper portion or the lower portion of said kneading zones, said method comprising piercing said agitating apparatus into a ground to be improved along a desired depth while preliminarily disturbing a soil layer of the ground, injecting and supplying the hardener to said kneading zone of the agitation spindle, agitating and kneading soft soil with the hardener to thereby harden and improve the lower portion of the soil layer to be improved, then drawing up the kneading apparatus and injecting and supplying the hardener above the kneading zone while the kneading apparatus is being drawn up, to thereby harden and improve the preliminarily disturbed soil layer entirely up to the top end thereof.

4,084,384

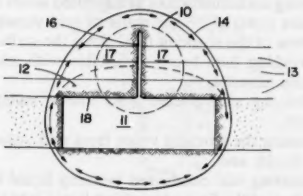
ADVANCED SLOT STRESS CONTROL METHOD OF UNDERGROUND EXCAVATION

Shosei Serata, 1229 8th St., Berkeley, Calif. 94710

Filed Sep. 13, 1976, Ser. No. 722,792

Int. Cl.² E01G 3/00

U.S. Cl. 61—42 5 Claims



1. A method for excavating a longitudinally extending underground opening, comprising the steps of initiating said underground opening at an excavation face, cutting at least one longitudinally extending slot through said excavation fact to interrupt and relieve the lateral shear stresses in the boundary formation around said excavation face, and thereafter excavating said face and continuing to cut said longitudinally extending slot ahead of said excavation face and wherein said longitudinally extending slot is cut generally orthogonally to the strata through which the excavation is proceeding to form a stress envelope beyond the distal extent of said at least one slot.

4,084,385

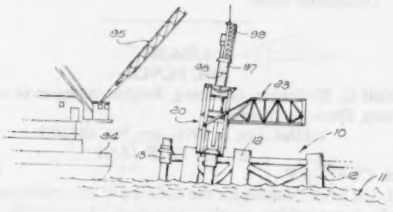
PILE HANDING METHODS

George I. Boyadjieff, Anaheim, Calif., assignor to Varco International, Inc., Orange, Calif.

Division of Ser. No. 710,450, Aug. 2, 1976, Pat. No. 4,051,587. This application Jan. 10, 1977, Ser. No. 758,078

Int. Cl.² E02D 7/00; B23P 19/04

U.S. Cl. 61—53.5 15 Claims



1. The method of driving a pile into an offshore seabed that comprises:

supporting on a pile guide the weight of a pile handling tool which includes a jacking mechanism and pile aligning means above the jacking mechanism;

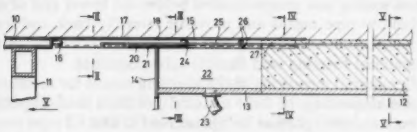
aligning a pile section with said jacking mechanism by said aligning means;
jacking said pile section longitudinally downwardly relative to and within said pile guide by operation of the jacking mechanism while said tool is supported by the guide;
moving said aligning means laterally from an active position to a retracted position;
moving a second pile section to a position above the first section while said aligning means are in said retracted position;
returning said aligning means to said active position;
aligning said second section with said first section by said aligning means,
connecting said sections together,
moving said aligning means to retracted position again; and
driving said connected pile sections downwardly within said jacking mechanism and guide and into the seabed by force exerted against an upper portion of said second section while said aligning means are in said retracted position.

4,084,386

APPARATUS FOR AND A METHOD OF TUNNELLING

Walter Hohn, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Dec. 22, 1976, Ser. No. 753,514
Claims priority, application Germany, Dec. 24, 1975, 2558670
Int. Cl.[2] E21D *9/06*
U.S. Cl. 61—85 **18 Claims**



1. A drive shield for use in tunnel driving operations; said shield comprising elongate drive members arranged side-by-side, means for supporting and guiding the drive members for individual displacement in the driving direction, a rear tail member provided for each drive member, the rear tail members being shaped to provide recesses open at the interior and combining to form a rear shield, means, including at least part of the rear shield, for defining a concrete reception space into which fluid concrete is introduced to create a tunnel lining, a bearing surface provided at least partially by covers extending over the recesses of the tail members wherein the defining means comprises a structure forming a front wall nearest the drive members which structure engages on said bearing surface.

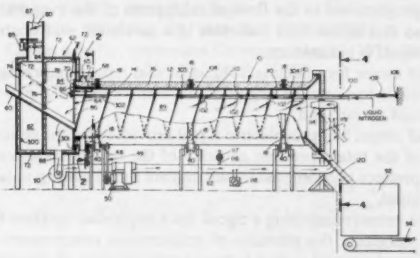
4,084,387

APPARATUS AND PROCESS FOR REFRIGERATING MATERIALS

John B. Schorsch, Rydal; William E. Graul, Drexel Hill, both of Pa., and David Barash, Ridgefield, Conn., assignors to The Union Corporation, Verona, Pa.

Division of Ser. No. 587,546, Jun. 17, 1975, Pat. No. 4,033,142, which is a continuation of Ser. No. 365,117, May 30, 1973, Pat. No. 3,906,743. This application Mar. 11, 1977, Ser. No. 776,599
Int. Cl.[2] F25D *13/06*
U.S. Cl. 62—63 **5 Claims**

1. A process for refrigerating material, comprising the steps of: introducing the material into a drum having an interior configuration which will transport the material through the drum upon rotation of the drum; rotating said drum so that said material is transported through said drum; and simultaneously introducing a refrigerant into said drum so as to refrigerate said material, said refrigerant being introduced in the form of a low temperature gas and causing said gas to flow in a direction counter to the direction of travel of said material through said drum by withdrawing some of the gas and re-introducing it at



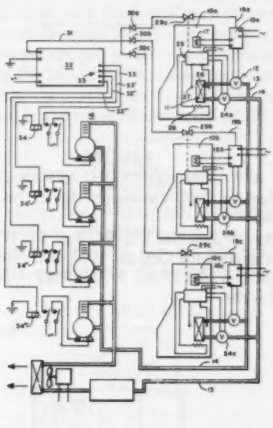
and through the end of the drum which is downstream when viewed in the direction of travel of material through said drum.

4,084,388

REFRIGERATION CONTROL SYSTEM FOR OPTIMUM DEMAND OPERATION

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 8, 1976, Ser. No. 739,405
Int. Cl.[2] F25D *21/06*
U.S. Cl. 62—152 **1 Claim**



1. In an energy conservation control system for controlling a plurality of refrigeration compressors to maintain the operating capacity of the operating compressors at a level to satisfy the load to each of a plurality of evaporators controlled by a control device thereby maintaining the total operating capacity dependent upon the load of the evaporator having the greatest load comprising;
a control having an input adapted to be connected to the control device of each of the evaporators wherein a control signal from each control device is indicative of the cooling load of the evaporator and an output adapted to be connected to each of the refrigeration compressors,
said input comprising means for selecting the control signal of the control device of the evaporator having the greatest load to control said output,
said output being adapted to selectively energize the refrigeration compressors dependent upon the magnitude of said control signal to maintain the total operating refrigeration capacity sufficient to satisfy the load of the evaporator having the greatest demand,
said control device is a temperature controlled valve to

control the flow of refrigerant of each evaporator to maintain the temperature at a predetermined value,

said control signal of each control device is an electric signal proportional to the flow of refrigerant of the evaporator so that as the flow increases to a maximum said control signal is a maximum,

said means for selecting a signal of said input comprising a diode to allow the largest of said control signals to pass to said output, and

said output being an electric signal providing for the control of the total operating capacity of the refrigeration compressors proportional to said control signal passing to said input,

said output comprising a circuit for a sequential operator for energizing the plurality of refrigeration compressors in sequence, said output increasing the number of compressors in operation depending on the magnitude of said control signal passing through said diode from the control device of the evaporator having the greatest load, and

said circuit comprising circuit means adapted to be controlled by means responsive to a need of defrost of the evaporator to disconnect said input from the control device of the evaporator being defrosted to allow another control signal of a control device to control the operating capacity of the refrigeration compressors.

4,084,389

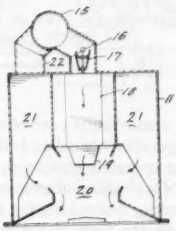
AIR CONDITIONING APPARATUS

Gershon Meckler, 7425 Democracy Blvd. Unit 212, Bethesda, Md. 20034

Continuation of Ser. No. 572,792, Apr. 29, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 735,548

Int. Cl.[2] F25D *17/00, 17/06;* **F24F** *7/00, 13/00*

U.S. Cl. 62—179 **2 Claims**



1. Apparatus for delivering air for air conditioning a zone of a building, said apparatus comprising, in combination, a chamber operatively connected to receive a first stream of primary, conditioned air and to deliver such air to the zone, means associated with said chamber operable to cause such air being delivered to the zone to induce a flow of air from within said chamber for mixture and delivery to the zone with such primary conditioned air, means providing a path for circulation of air from the zone to the interior of said chamber, means operable to deliver a second stream of primary, conditioned air to the interior of said chamber, and means for controlling the flow of air through said means providing a path and through said means operable to deliver a second stream of primary air.

4,084,390

APPARATUS FOR PACKAGING BULK MATERIAL

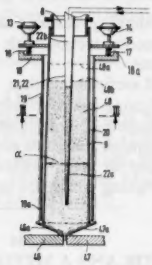
Florian Schmachtel, Grossen-Linden, and Heinrich Mueller, Lindenstruth, both of Germany, assignors to Rovema Verpackungsmaschinen GmbH & Co. KG., Giessen, Germany

Filed Apr. 1, 1977, Ser. No. 783,956

Claims priority, application Germany, Apr. 8, 1976, 2615270

Int. Cl.[2] B65B *31/04*

U.S. Cl. 53—112 A **18 Claims**



1. An apparatus for packaging of powdery bulk materials, comprising:

a flexible tube bag forming machine having a generally vertically aligned hollow fill pipe means thereon around which is formed a flexible tube container;

cross sealing jaw means located below the lower end of said hollow pipe means and movable laterally back and forth for periodically closing and sealing the lower end of the material forming said flexible tube container;

bulk material measuring and dispensing means for measuring and dispensing of bulk material portions, said dispensed bulk material portion being received in said fill pipe means only after said cross sealing jaw means has closed and sealed said lower end of said flexible tube container;

suction means for evacuating gas contained in said bulk material portion in said fill pipe means, said suction means comprising at least one suction probe having suction openings over the outer surface thereof, said suction probe being arranged in the interior of said fill pipe means; and

expelling means for simultaneously expelling said bulk material portion from said fill pipe means into said flexible tube container and effecting the removal of said flexible tube container from said lower end of said fill pipe means.

4,084,391

AUTOMATIC PACKAGING APPARATUS

Winfried Wilbur Williams, Sr., Salisbury, and David Clancy, Canaan, both of Conn., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 557,093, Mar. 10, 1975, Pat. No. 3,973,373. This application Jun. 1, 1976, Ser. No. 691,870

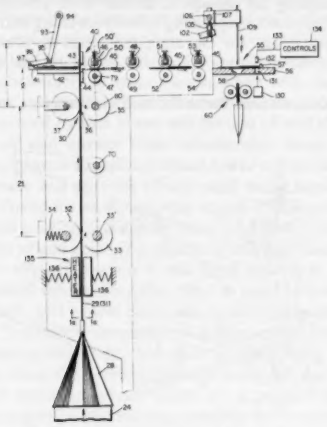
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] B65B *63/04*

U.S. Cl. 53—120 **8 Claims**

1. Apparatus for automatically packaging towelettes and comprising means for positioning open envelopes in succession at an insertion station, characterized by means for feeding the longitudinally folded leading end of a web of absorbent towellete material in a substantially vertical upward path, means for severing successive strips of predetermined length from said longitudinally folded moving leading end at the end of said path, first transverse fold means for folding each of said strips in succession into a J-fold condition wherein the longer leg of the J is about twice the length of the shorter leg and each first folded strip is moved along a substantially horizontal path, and second transverse fold means for folding the longer leg of the J of each said first folded strip in succession substantially about

its midpoint to form a folded towelette of about three times the original longitudinal folded strip thickness while at the same



time thrusting it substantially vertically downward into an envelope positioned at said station in timed relation to receive it.

4,084,392

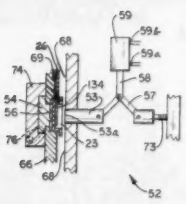
APPARATUS FOR PRINTING AND FEEDING CAPS TO A BOTTLE CAPPING MACHINE

Leo J. Von Hagel, North Massapequa, N.Y., assignor to Honeywell Farms, Inc., New York, N.Y.

Division of Ser. No. 522,731, Nov. 11, 1974, abandoned. This application Oct. 7, 1976, Ser. No. 730,589

Int. Cl.[2] B65B *61/00*

U.S. Cl. 53—131 5 Claims



1. In an apparatus for filling, capping and dating bottles, comprising means for feeding bottles through said apparatus, bottle filling means, means for feeding plastic caps to the filled bottles and means for applying said caps to said bottles, the improvement comprising means for printing a date on said caps before they are applied to the bottles, said printing means including cap-imprinting means and indexing means for accurately locating the caps successively in printing position in fixed relationship to said imprinting means, said indexing means including pawl means, means for driving said pawl means, cap engaging means, a toothed ratchet wheel operatively connected to said cap engaging means and driven by said pawl means, the construction and arrangement being such that during the driving of said pawl means said pawl means engages a tooth of said ratchet wheel to move said ratchet wheel and means to wedge said pawl means against the teeth of said ratchet wheel to prevent movement of said ratchet wheel.

4,084,393

APPARATUS FOR MAKING AND FILLING HINGED BOXES OF A FOLDABLE MATERIAL

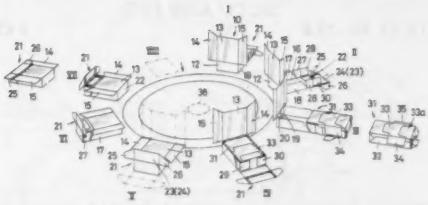
Heinz Focke, Verden, Aller, Germany, assignor to Focke & Pfuhl, Verden, Aller, Germany

Filed Aug. 21, 1975, Ser. No. 606,826

Claims priority, application Germany, Aug. 21, 1974, 2440006

Int. Cl.[2] B65B *19/20*

U.S. Cl. 53—137 84 Claims



1. In an apparatus for producing and filling hinged boxes from a foldable, blank, said blank having front, rear and end walls, side walls formed from lateral flaps, and a blank section forming a hinged lid; the improvement comprising: a rotating turret, said turret having a number of pockets; each pocket open radially outwards and upwards for receiving a blank, punch means for pressing said blank into a pocket, said punch means comprising a punch plate, wherein a free surface of said pocket is covered by said rear wall of the blank, means for folding said end wall, said front wall and side walls into an upright position on the radial inner side of said pocket and said lateral flaps into an upright position and wherein said blank sections forming the hinged lid lie in the same plane as the rear wall of said blank and contents are insertable in said pocket in a radial direction in the plane of said rear wall of the blank.

4,084,394

HARVESTER

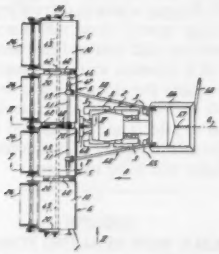
Cornelis van der Lely, Zug, Switzerland, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Aug. 26, 1975, Ser. No. 607,762

Claims priority, application Netherlands, Sep. 2, 1974, 7411599

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—14.6 7 Claims



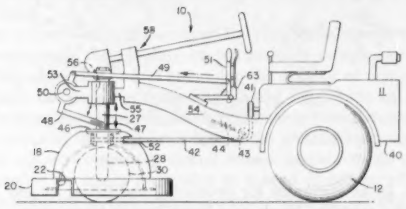
1. A harvester machine for attachment to a tractor comprising a plurality of harvester units, said units each having a frame and the frames of the units being interconnected by pivot means which are provided at their adjacent sides, said units extending transversely side by side relative to the direction of operative travel, each said unit comprising cutting, threshing and cleaning mechanisms, common coupling means for said units on the machine for connection to a three point lifting hitch provided at the front of the tractor, a container attached at the rear of the tractor wherein a delivery device is posi-

tioned to receive processed crop from at least one harvester unit, said device having at least one outlet conduit extending over the tractor to its rear with an opening above said container.

4,084,395
WORKING VEHICLE

William G. Nannen, P.O. Box 242, Smethport, Pa. 16749

Continuation-in-part of Ser. No. 520,153, Nov. 1, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,891
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—15.4 9 Claims



1. A lawn mower comprising:

a body, including a plurality of ground-engaging wheels and a frame which includes a hood member secured to said frame, said hood member including a lower portion and an upwardly extending generally cylindrical upper portion adapted to receive a rotatable member therein;

a bell-shaped rotatable cutting member including grass cutting means secured to a main portion thereof, said rotatable cutting member including a sleeve portion extending vertically from a top part of said main portion and rotatably secured in a journaled relationship by at least a pair of bearings within and spaced along said upper portion of said hood member, the rotation of said cutting means defining a path contained within the area of said lower portion of said hood member, said cutting means including a flange portion extending outwardly from a bottom edge of said main portion, and a plurality of blades secured at spaced intervals to said flange portion;

power means supported on said body for rotating said rotatable member to perform work by the rotation of said grass cutting means at a predetermined position relative to ground;

a spindle operatively connected to at least one of said ground-engaging wheels and including a portion rotatably journaled substantially entirely within and closely adjacent to the sleeve portion of said rotatable member along substantially the entire length thereof by at least a second pair of bearings spaced along said sleeve portion of said rotatable member, said first and said second pairs of bearings being on a common axis, whereupon said one wheel is rotatable within the area circumscribed by the rotation of said work portion of said rotatable member; and

means secured to said frame and to said hood member for adjusting the cutting height of said cutting means as a unit which includes said hood member.

4,084,396
ADJUSTABLE ROW SPACING FORAGE HEAD

David P. Fritz; Rex O. Weigand, and Gary L. Fleming, all of Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jan. 19, 1976, Ser. No. 650,142
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—98 20 Claims

1. In a mobile crop harvester:

a frame;

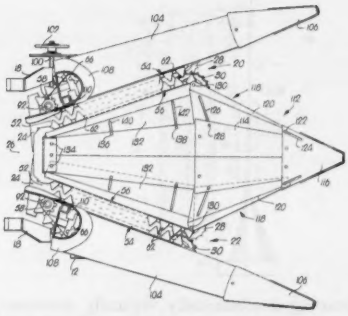
a pair of normally inclined row crop harvesting units, each of said units having mechanism which includes:

means defining an elongated, fore-and-aft extending passage and having a normally elevated rear discharge end and a normally lowered front inlet end,

cutting means at said inlet end for severing standing crops approaching the passage as the harvester advances, and

a pair of opposed cooperating conveyors along said passage-defining means for elevating the crops severed by said cutting means through said passage and out said discharge end;

drive means on said frame for said mechanisms; and



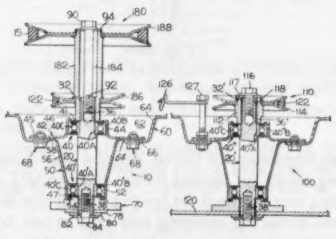
means mounting said units on said frame for lateral swinging movement relative to one another to permit selective changing of the spacing of the passages at said inlet ends without changing the spacing at said discharge ends,

said conveyors being swingable with their respective units and each including a pair of rotatable members at said opposite ends and an endless, flexible element looped about said members, at least one of said units having its axis of swinging movement coinciding with the axis of rotation of one of the members at said discharge end.

4,084,397
ARBOR ASSEMBLY FOR ROTARY MOWERS

Laurence R. McGrath, Cedarburg, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 644,881, Dec. 29, 1975, abandoned. This application Mar. 7, 1977, Ser. No. 774,813
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—255 7 Claims



1. In combination, an arbor assembly for use with rotary mowers comprising a shaft, said shaft having an intermediate portion of greater diameter and opposite upper and lower end portions of reduced diameter whereby to define a shoulder between each of said end portions and said intermediate portion, an upper and a lower antifriction bearing assembly respectively positioned on the respective opposite end portions, each of said antifriction bearing assemblies comprising an inner race and an outer race, the inner race of each of said antifriction bearing assemblies being engaged with its corresponding reduced diameter end portion with an interference fit and also seating against the shoulder contiguous the corresponding

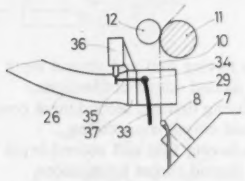
reduced diameter end portion of said shaft, the outer race of each of said bearing assemblies being adapted to be engaged by a corresponding bearing retainer means supported by the mower housing, the outermost portion of each of said reduced diameter end portions lying beyond the corresponding bearing assembly and being splined on the exterior surface thereof, a pulley subassembly in splined engagement with the splines of said upper end portion of said shaft, and a mower blade subassembly carried by said lower end portion of said shaft, with a portion of said mower blade subassembly being in splined engagement with the splines of said lower end portion, each of the opposite end portions of said shaft being tapped with an internal thread for receiving a cap screw, the cap screw at said upper end portion serving to retain said pulley subassembly assembled to said upper end portion of said shaft, the cap screw at said lower end portion of said shaft serving to retain said mower blade subassembly assembled to said lower end portion of said shaft, said mower blade subassembly comprising a blade adaptor positioned immediately contiguously beneath said lower bearing assembly, said blade adaptor being positioned coaxially about the reduced diameter lower end portion of said shaft and including splines which are in splined engagement with the splines on said reduced diameter lower end portion of said shaft, a mower blade positioned coaxially about said reduced diameter lower end portion of said shaft and immediately contiguous the under surface of said blade adaptor, said mower blade having a radial clearance relative to said reduced diameter lower end portion of said shaft permitting relative rotation between said mower blade and said shaft under shock load conditions on said mower blade, said cap screw at said lower end portion of said shaft being engaged with the internally tapped thread at said lower end portion of said shaft to retain said mower blade subassembly assembled to said lower end portion of said shaft.

4,084,398

MOBILE SERVICING ARRANGEMENT FOR OPEN-END SPINNING MACHINES

Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Uberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Sussen, both of Germany

Filed Jun. 7, 1976, Ser. No. 693,150
Claims priority, application Germany, Jun. 7, 1975, 2525560
Int. Cl.² D01H *13/22*
U.S. Cl. 57—34 R **29 Claims**



18. A servicing arrangement displaceable along an open-end spinning machine having a plurality of individual spinning stations, each of which produces a running thread, the arrangement comprising: means for monitoring the thread at each spinning station including at least one measuring head means associated with the running thread for selectively detecting the quality of the running thread and providing a control signal to a spinning machine control means, and

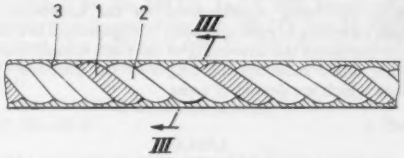
wherein a plurality of measuring head means are provided and arranged so as to be selectively aligned with an equal number of adjacent spinning stations, and a common setting means for displacing said measuring head means from a rest position to a thread detecting position in response to a signal from the control means is provided.

4,084,399

GUT FOR RACKET

Toyonosuke Kanemaru, Tokyo; Yukuo Hisatomi, and Takafumi Nishimoto, both of Yokohama, all of Japan, assignors to Nippon Carbon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,685
Claims priority, application, Japan, Mar. 31, 1976, 51-34316
Int. Cl.² D02G *3/04, 3/36, 3/44*
U.S. Cl. 57—140 C **20 Claims**



1. A gut for a racket comprising a combination of carbon fibers and organic fibers, and synthetic resin mixed with said carbon fibers which are in the form of chopped carbon fiber filaments.

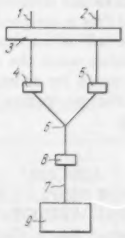
6. A gut for a racket comprising a combination of carbon fibers and synthetic fibers and at least one of the two kinds of fibers is twisted to produce a combined fiber gut having a substantially linear relation between tensile modulus and elongation and wherein the modulus value ranges from about 260 Kg./gut to about 290 Kg./gut.

4,084,400

METHOD OF MAKING SELF-TWISTED FIBROUS PRODUCT FROM AT LEAST TWO STRANDS

Pavel Mikhailovich Movshovich, Pechatnikov pereulok, 3, kv. 8, Moscow; Viktor Pavlovich Khavkin, ulitsa Vatutina, 11, kv. 4, Moskovskaya oblast, Khimki; Gennady Konstantinovich Maximov, Kaspiiskaya ulitsa, 20, korpus 3, kv. 137, Moscow; Lev Nikolaevich Ivanov, Kotelnicheskaya naberezhnaya, 25/8, kv. 74, Moscow; Natalya Borisovna Babushkina, Chasovaya ulitsa, 5b, kv. 15, Moscow; Vasily Ivanovich Kulikov, Varshavskoe shosse, 18, korpus 3, kv. 412, Moscow; Boris Semenovich Shkrabov, ulitsa Udaltsova, 73a, kv. 34, Moscow; Sergei Vladimirovich Nezelenov, Kineshemskoe shosse, 8a, kv. 6, Kostroma; Gennady Nikolaevich Shutov, ulitsa Sovetskaya, 119, kv, 101, Kostroma; Leonid Nikiforovich Tsygulev, Prospekt textilschikov, 94a, kv. 103, Kostroma, and Vadim Sergeevich Ilin, ulitsa 8 Okruzhnaya, 11, kv. 11, Kostroma, all of U.S.S.R.

Filed Aug. 17, 1976, Ser. No. 715,167
Int. Cl.² D01H *7/90;* D02G *3/26*
U.S. Cl. 57—156 **5 Claims**



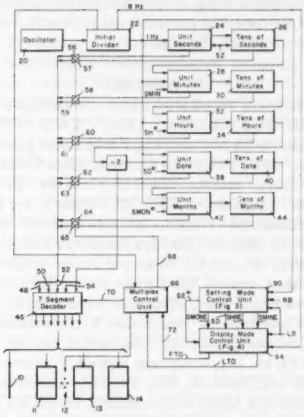
1. A method of making a self-twisted fibrous product from at least two strands, comprising the steps of: continuously feeding two strands, applying simultaneously and identically to each one of said continuously fed strands a torque imparting to said strands an alternating twist, with each strand having between successive portions to which alternating twist is applied a portion which is devoid of twist; then uniting said strands at a free point of engagement therebetween without exerting any

frictional action on said strands for plying said strands together while they untwist about one another during travel beyond said point of engagement and to form only from said plied strands the product which is subsequently wound into a package; positively applying to said plied strands, as they are untwisting about one another, during travel beyond said point of engagement, a final torque coinciding with the direction of their untwisting about one another, with the frequency of the variation of the direction of said final torque equalling the frequency of the variation of the sense of the twist imparted to each one of said strands prior to said point of engagement, said final torque being superimposed on the untwisting plied strands travelling beyond said point of engagement in a manner which intensifies the untwisting of the plied strands about one another while reducing the length of the portions of said strands which are devoid of twist.

4,084,401
DIGITAL WATCH WITH TWO BUTTONS AND IMPROVED SETTING AND DISPLAY CONTROL

Richard J. Belardi, Anaheim; Norman E. Moyer, and Ernest C. Ho, both of Newport Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Jul. 9, 1975, Ser. No. 594,384
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—4 A **6 Claims**



1. A digital watch including a push button recessed in the case, and means for sequentially selecting, month, date, hours, or minutes for setting by successive pushes of said recessed button, means responsive to said selecting means for displaying said selected horological data in assigned first and second pairs of digit positions with a dash when the data selected is either month or date and a colon when the data selected is either hours or minutes, and means for setting the data selected in response to pushing another protruding button while that data is displayed for viewing.

4,084,402
TIMING CIRCUIT FOR DISPLAY SEQUENCING IN A DIGITAL WRISTWATCH

Norman E. Moyer, Newport Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 22, 1975, Ser. No. 579,998
Int. Cl.[2] G04C *3/00*; G04B *19/30*
U.S. Cl. 58—23 R **6 Claims**

1. A digital timing circuit in a digital watch with two electro-optical display elements, when said circuit is activated by a manually operable switch, the timing sequence begins and said display elements display a first set of horological information, then said display elements are blank for a short duration, and finally display a second set of horological information and are then blank again, comprising:

a clock pulse source;

first gate means having first and second input connections and an output connection;

said first input of said first gate connected to said clock pulse source;

second gate means having first and second input connections and an output connection;

said second input of said first gate connected to said output of said second gate;

third gate means having first and second input connections and an output connection;

fourth gate means having first and second input connections and an output connection;

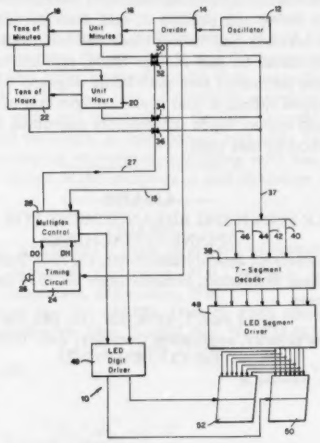
said output of said third gate connected to said first input of said second gate and to said first input of said fourth gate;

said output of said fourth gate connected to said input of said third gate;

a manually operable switch for activating said digital timing circuitry, said switch connected to said first input to said third gate;

fifth gate means having first, second, third, and fourth input connections and an output connection;

first flip-flop having first and second input connections and first and second output connections;



second flip-flop having first and second input connections and first and second output connections;

third flip-flop having first and second input connections and first and second output connections;

fourth flip-flop having first and second input connections and first and second output connections;

two phase clock generating means having an input connection connected to said output of said first gate means and having a first output connected to said first input of said first flip-flop and a second output connected to said second input of said first flip-flop;

said first output of said first flip-flop connected to said first input of said second flip-flop, to said second input to said second gate and to said first input to said fifth gate;

said second output of said first flip-flop connected to said second input of said second flip-flop;

sixth gate means having first and second input connections and an output connection;

said first output of said second flip-flop connected to said first input of said third flip-flop and to said first input of said sixth gate;

said second output of said second flip-flop connected to said

second input of said third flip-flop, and to said second input of said fifth gate;
said second output from said third flip-flop connected to said third input to said fifth gate and to said second input of said fourth gate for forcing said flip-flop into a known state;
said first output of said third flip-flop connected to said first input of said fourth flip-flop;
said second output of said third flip-flop connected to said second input of said fourth flip-flop;
said first output of said fourth flip-flop connected to said second input of said sixth gate;
said second output of said fourth flip-flop connected to said fourth input of said fifth gate;
first and second electro-optical display elements which display the digits of first and second sets of horological information;
said output of said sixth gate being connected to said first electro-optical display elements;
said second output of said third flip-flop being connected to said second electro-optical display elements;
said second set of horological information is displayed on said electro-optical display elements when said output of said sixth gate is at a logical binary high level and said second output of said third flip-flop is at a logical binary low level; and
said first set of horological information is displayed on said electro optical display elements when said outputs of said sixth gate and said second output of said third flip-flop are at a logical binary high level.

4,084,403

DRIVING MECHANISM FOR A TIMEPIECE

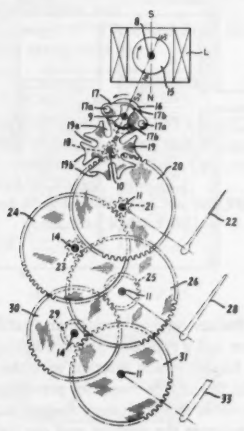
Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kozo Sato, Yotsukaido; Nobuo Shinozaki, Chiba; Yuzuru Takazawa, Togane, and Yoichi Seki, Kamiiwahashi, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Feb. 2, 1976, Ser. No. 654,224

Claims priority, application Japan, Feb. 7, 1975, 50-15998; Feb. 7, 1975, 50/15998

Int. Cl.² G04C *3/00*; H02K *33/00*

U.S. Cl. 58—23 D **3 Claims**



1. A driving mechanism, for use in a timepiece, comprising: an electrical stepping motor having a rotor which rotates in one direction through a predetermined angular interval each time said stepping motor is energized; a driving member mounted for rotation and driven by said rotor to rotate as said rotor rotates; a driven member mounted for rotation and driven to rotate by said driving member; a time wheel having a pointer for indicating time and driven to rotate upon rotation of said driven member; and said driving member and said driven member together including means comprising an intermittent driving mechanism for enabling said driving member to drive said driven member only during a portion of the predetermined angle of rotation of said driving member.

4,084,404

ELECTRONIC WATCH

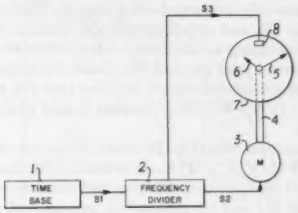
Fridolin Wiget, Neuchatel, Switzerland, assignor to Ebauches S.A., Switzerland

Continuation of Ser. No. 603,121, Aug. 8, 1975, abandoned, and a continuation-in-part of Ser. No. 399,717, Sep. 24, 1973, abandoned. This application Dec. 23, 1976, Ser. No. 753,844

Claims priority, application Switzerland, Oct. 17, 1972, 15177/72

Int. Cl.² G04B *19/30*; G04C *3/00*; G04B *27/00*

U.S. Cl. 58—50 R **6 Claims**



1. An electronic watch, comprising;
a time base of at least sonic frequency;
frequency divider means for driving said frequency to deliver output pulses at a low output frequency of N/60 cycles per second, where N is a whole number included between 1 and 16, and with a pulse duration (pulse width) ranging from about 10 to about 30 milliseconds;
a low-frequency step motor having at most 10,600 windings of wire of at least 25 micron thickness energized step-by-step by said output pulses; and
a time display unit, including as a most rapidly rotating element thereof, a minutes display member driven directly by said motor by one step per output pulse, and a watch dial for the driven display member.

4,084,405

REFRIGERATING SYSTEM

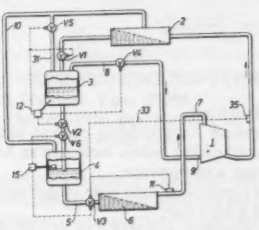
Hjalmar Schibbye, Saltsjobaden, and Tord Holmström, Saltsjo-Boo, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed Sep. 30, 1976, Ser. No. 728,156

Claims priority, application United Kingdom, Sep. 30, 1975, 39986/75

Int. Cl.² F25B *41/00*

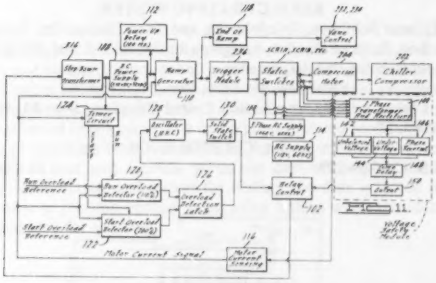
U.S. Cl. 62—197 **11 Claims**



1. A refrigerating system comprising:
an evaporator (6) having an inlet and an outlet;
a condenser (2) having an inlet and an outlet;

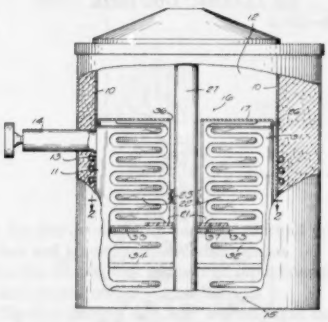
a compressor device (1), the output of which is coupled to said condenser inlet;
a supply line (5) coupled to said inlet of said evaporator (6);
a throttle valve (V3) located in said supply line (5) to said inlet of said evaporator (6);
a closed receiver tank (3) containing a liquid refrigerant and having an inlet and an outlet;
an inlet valve (V1; V11) coupling an inlet of said closed receiver tank (3) to said outlet of said condenser (2);
an outlet valve (V2; V21) coupling an outlet of said closed receiver tank (3) to said supply line (5) for said evaporator (6);
control means (12; 121) coupled to said closed receiver tank (3) for controlling the amount of liquid refrigerant in said closed receiver tank (3), said control means being further controllably coupled to said inlet and outlet valves for controlling the operation of said inlet and outlet valves;
said compressor device (1) including a first inlet channel (7) permanently communicating with said outlet of said evaporator (6), and an additional inlet channel (9);
means including an additional valve (V4; V41) coupling said additional inlet channel (9) of said compressor device (1) to the top of said closed receiver tank (3), said additional valve (V4; V41) being coupled to said control means (12; 121);
said control means (12; 121) controlling said valves (V1, V2, V4; V11, V21, V41) for intermittent disconnection of said closed receiver tank (3) from said condenser (2) and evaporator (6) and corresponding intermittent connection of the top of said closed receiver tank (3) to said additional inlet channel (9) for a time interval; and
an additional receiver tank (4) containing a controlled amount of liquid refrigerant coupled to said condenser (2) and further coupled to said evaporator (6) for feeding said evaporator (6) under the influence of the condenser pressure supplied to said additional receiver tank (4), thereby maintaining the refrigerating cycle during said intermittent time interval.

4,084,406
CHILLER CONTROLS
Daniel A. Brenneman, Kettering, Ohio, assignor to Fedders Corporation, Edison, N.J.
Filed Jan. 22, 1976, Ser. No. 651,386
Int. Cl.[2] H02P 1/26; F25B 49/00
U.S. Cl. 62—211 **10 Claims**



1. In combination:
a chiller system for providing cooling to a medium to be cooled, said chiller system including an AC electric motor for driving a compressor;
controlled conduction solid state switch means having a line side and a load side;
means for coupling said line side of said solid state switch means to a source of AC electric power;
means for coupling said load side of said solid state switch means to said AC electric motor; and
means for accelerating said AC electric motor to running speed comprising means for controllably applying trigger signals to said solid state switch means such that the firing angle at which said solid state switch means is fired in relation to the voltage phase angle of the source of AC electric power is progressively increased from a minimum firing angle to a maximum firing angle to thereby start and accelerate the motor to running speed;
said electric motor being of the polyphase type;
said solid state switch means comprising a solid state switch in each of said phases;
and voltage safety means for protecting said motor against a fault in the voltage actually applied to the motor;
said voltage safety means comprising a transformer for each of said phases; each of said transformers having a respective primary and a secondary winding;
each of said transformers having a primary winding connected between a line side of said switch associated with a respective phase and a load side of said switch associated with another phase;
monitoring circuit means connected across the respective secondary windings of each of said transformers for monitoring a parameter of the voltage waveform of each of said phases, and for generating a signal when the monitored parameter exceeds a preselected value;
and disconnect means responsive to said monitoring circuit means signal for disconnecting said motor from the source of AC electric power.

4,084,407
SLUSH FREEZER
Alfred E. Anhalt, Kiel, Wis., assignor to Stoelting Brothers Company, Kiel, Wis.
Filed Feb. 2, 1977, Ser. No. 765,015
Int. Cl.[2] F25C 5/12
U.S. Cl. 62—342 **4 Claims**



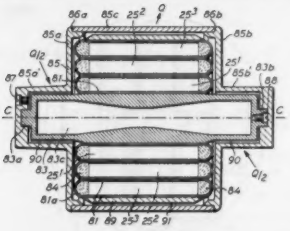
4. In a slush freezer having a stationary baffle with a set of stationary fingers and a rotatable agitator having a shaft and a set of movable fingers which interact with the stationary fingers of the baffle, the improvement for preventing interference between the movable and stationary fingers and comprising a thrust bearing between the agitator and the baffle, said thrust bearing comprising a washer about the agitator shaft and having one side against the baffle and its other side against the agitator, said agitator comprising a comb having a back from which the fingers extend inwardly toward the agitator shaft, an arm spanning between the comb back and the shaft to support the comb, said fingers having tips spaced from the shaft a distance greater than the radius of the washer to permit the washer to slide along the shaft to a position engaging the arm without interference with the fingers.

4,084,408

METHOD OF RECOVERING ENERGY BY MEANS OF A CYCLIC THERMODYNAMIC PROCESS

Baltzar von Platen, Ystad, Sweden, assignor to Fondation Cum Plate, Vaduz, Liechtenstein

Continuation of Ser. No. 510,616, Sep. 30, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,305
Int. Cl.[2] F25B *3/00*
U.S. Cl. 62—467 R 17 Claims



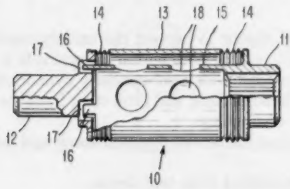
1. A method of transferring heat energy by means of a cyclic thermodynamic process comprising the steps of:
providing an axis of rotation,
providing a plurality of rigid annular containers positioned adjacent one to another concentric about said axis and located at progressively greater radial distances from the axis of rotation,
providing good thermal conductivity between said chambers,
providing in each of said chambers a mixture of propane and an inert gas sealed therein,
mounting said concentric annular chambers in an enclosing hermetically sealed static chamber closely spaced from said annular chambers for defining a narrow gap therebetween,
filling said narrow gap with hydrogen,
rotating said concentric annular containers at high speed about said axis,
allowing heat energy to enter the innermost of said concentric annular chambers, and
allowing heat energy to be released from the outermost of said chambers across said gap.

4,084,409

FLEXIBLE COUPLING FOR ROTATABLE SHAFTS

John C. Wolf, New Fairfield, Conn., and Thomas G. Costello, Fishkill, N.Y., assignors to Controlex Corporation of America, Croton Falls, N.Y.

Filed May 6, 1976, Ser. No. 683,910
Int. Cl.[2] F16D *3/52*
U.S. Cl. 64—11 B 8 Claims



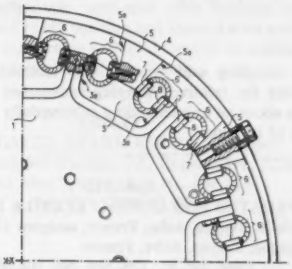
1. A flexible coupling for rotatable shafts which comprises a metal bellows as the primary connecting element between the two ends of said coupling, said bellows having corrugations disposed only adjacent said two ends of said coupling, and a concentric sleeve attached to one of said ends and extending toward the other of said ends, said other end having a plurality of slots and the free end of said sleeve having a plurality of keys projecting into said slots without making contact therewith so long as said bellows is not ruptured, and said sleeve being disposed out of contact with said bellows.

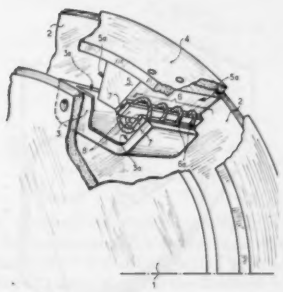
4,084,410

FLEXIBLE COUPLING DEVICE

Pierre Michon, Chatillon-sous-Bagneux, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Apr. 27, 1976, Ser. No. 680,745
Int. Cl.[2] F16D *3/58*
U.S. Cl. 64—12 14 Claims





1. A flexible coupling and vibration damping device for a driving member and a driven member comprising a first cable loop element defined by a plurality of parallel loops of cable, said loops being substantially coaxial, first clamping means connected to a first peripheral portion of each of said loops, second clamping means connected to a second peripheral portion of each of said loops, first means for joining one of said members to one of said clamping means and second means for joining the other said member to the other said clamping means.

4,084,411

RADIAL MISALIGNMENT COUPLING

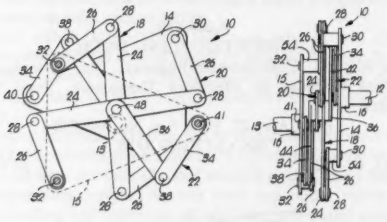
Alfred B. Mayfield, Halstead, Kans. 67056

Filed Oct. 19, 1976, Ser. No. 733,765
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—19 10 Claims

1. A torque transmitting device for operably coupling end-to-end two rotatable members having generally parallel axes of rotation shiftable relative to one another, said device including:
a plurality of linkages disposed between and interconnecting the adjacent ends of said members,
each of said linkages comprising a central link and a first and second connecting link respectively, pivotally mounted on opposite ends of said central link;

first means pivotally securing said first connecting links to one of said members;

second means pivotally securing said second connecting links to the other of said members; and



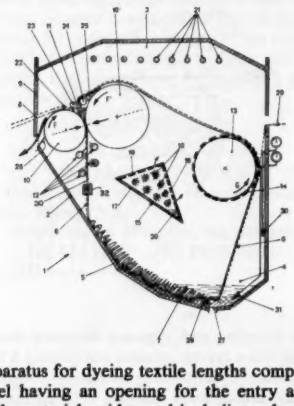
means coupling said central links intermediate the ends thereof for relative swinging movement of the central links about an axis extending substantially parallel to said axes of rotation.

4,084,412

APPARATUS FOR DYEING TEXTILE LENGTHS

Jean Levielle, Troyes, Aube, France, assignor to Teinturerie de Champagne, Troyes, Aube, France

Filed Jul. 9, 1976, Ser. No. 704,052
Int. Cl.² D06B *21/02*
U.S. Cl. 68—5 C **13 Claims**



1. Apparatus for dyeing textile lengths comprising:

a vessel having an opening for the entry and exit of the textile material, said vessel including a hood in its upper part and a cuvette in its lower part, said cuvette holding a dyestuff and a washing liquor,

heating means in said hood for heating the hood,

temperature measuring apparatus to ascertain the temperature of the dyestuff and washing liquor, as well as the temperature in the interior of the vessel,

a station in said vessel for padding or impregnating and dyeing said textile material,

a cylinder for carrying the textile material along a path from said station, and

means disposed along said path in said vessel including washing elements for washing said textile material,

a steam box,

a protective device to protect against the intrusion into the vessel of a hand or the like of the operator of the apparatus,

guide rolling members for guiding said textile material, and

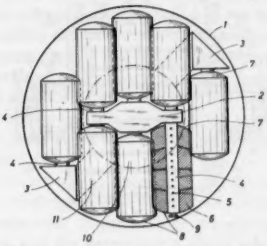
an auxiliary guiding member adjacent to said guide rolling members for insuring that a length of textile material follows a predetermined path.

4,084,413

APPARATUS FOR LIQUID TREATMENT AND DRYING OF BOBBINS

Hans Børge Nielsen, Reinhach, Switzerland, assignor to Vald. Henriksen A/S, Denmark

Filed Oct. 7, 1976, Ser. No. 730,240
Claims priority, application Denmark, Oct. 8, 1975, 4531/75; Aug. 3, 1976, 3498/76
Int. Cl.² D06B *5/18*
U.S. Cl. 68—189 **2 Claims**



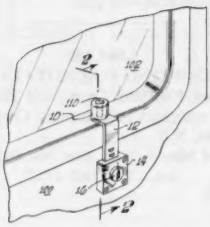
1. An apparatus for liquid treatment and drying of bobbins comprising a vertical, cylindrical container having a removable insert with horizontal distributor pipes on which the bobbins may be arranged, said apparatus furthermore being provided with means for circulating liquid or air through the distributor pipes, characterized in that the insert comprises a diametrically arranged, oblong distribution chamber and two or more distribution chambers located along the container wall, from which distribution chamber distributor pipes of equal length extend in parallel.

4,084,414

ANTI-THEFT DEVICE FOR AUTOMOBILE DOORS

Michael D. Martin, 1626 S. Regene St., Pomona, Calif. 91766

Filed May 27, 1976, Ser. No. 690,590
Int. Cl.² F16C *3/00*
U.S. Cl. 70—181 **3 Claims**



1. An anti-theft device to prevent the unauthorized operation of an automobile door latch button reciprocable in a vertical direction, provided with a substantially cylindrical shank and an enlarged head portion, and projecting from the inward sill of said door, comprising:

a generally cylindrical sleeve disposed about said latch button,

strap means depending from said sleeve,

a plurality of locating stops vertically spaced from one another in the surface of said strap means,

lock means, attached to the inner surface of said door, for lockingly engaging one of said locating stops,

said sleeve having its inner orifice in sliding engagement with the shank of said latch button and having an outer diameter larger than the diameter of said head portion, and

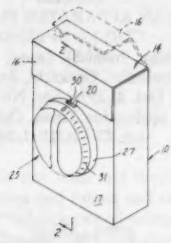
said sleeve having a depression in its upper surface for receiving the head of said button in the lowermost position thereof, whereby said head is rendered inaccessible to unauthorized persons.

4,084,415

CIGARETTE CASE WITH TIMER

Warren Corman, 59 Vicksburg St., San Francisco, Calif. 94114

Filed Mar. 18, 1977, Ser. No. 779,048
Int. Cl.[2] G04B *19/02, 37/12;* E05B *43/00*
U.S. Cl. 70—269 **4 Claims**



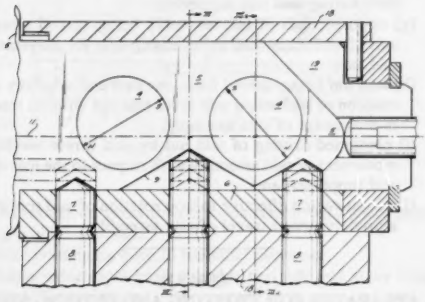
1. A cigarette case including a box having a swingable lid for closing the same,
said lid having a flap superposed over one side of said box when said lid is closed,
a clasp on said flap adjacent the free edge thereof,
a timer secured to said one side,
said timer including an outer rotatable dial normally overlying said clasp for preventing swinging of said flap,
said dial being formed with a slot adapted to register with said clasp in one position of said dial to permit opening of said flap and lid.

4,084,416

MAGNETIC-TYPE LOCK

Kurt Prunbauer, Herzogenburg, Austria, assignor to EVVA Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft, Vienna, Austria

Filed Jun. 28, 1976, Ser. No. 700,207
Claims priority, application Austria, Jul. 3, 1975, 5119/75
Int. Cl.[2] E05B *47/00*
U.S. Cl. 70—276 **10 Claims**



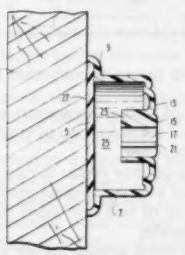
1. A lock comprising:
a generally nonrotatable housing;
a cylinder rotatable in said housing and formed with a keyhole defining an axis;
at least one tumbler radially displaceable into said keyhole and having a housing part and a cyliner part radially slidable in said housing and cylinder between a locked position with one of said parts extending between said housing and said cylinder and inhibiting relative rotation of said cylinder and housing and an unlocked position with said housing part in said housing and said cylinder part in said cylinder and permitting said rotation;
at least one magnetic rotor element rotatable in said cylinder between a ready position and an unready position;
a retaining element engageable with said housing and with said rotor element and displaceable generally axially in said cylinder only when said rotor element is in said ready position from an engaged position inhibiting said rotation into a disengaged position permitting said rotation, one of said elements being formed with an open notch and the other of said elements having a part axially engageable therein only in said ready position; and
a key insertable axially into said keyhole and carrying a magnet juxtaposable with said rotor element to rotate same into said ready position and formed with at least one bit radially engageable with said tumbler to displace same radially into said unlocked position.

4,084,417

SIMULATED DEADLOCK FOR DOORS

William H. Daniel, 541 Putman Rd., Rogers, Ark. 72756

Filed May 7, 1976, Ser. No. 684,162
Int. Cl.[2] E05B *17/00*
U.S. Cl. 70—431 **1 Claim**



1. A simulated deadlock for doors, comprising a member which has a flat rear surface and forward surfaces which simulate only those portions of a deadlock which protrudes from the forward surface of a door to which the deadlock is applied, whereby said member may be adhesively applied to a door to discourage attempts at unauthorized entry through the door, said member being in the form of a hollow plastic shell, said shell having a peripheral flange which is hollow and opens rearwardly and in which a flat base plate is secured, the rear surface of said base plate comprising said flat rear surface of the simulated deadlock, said shell having in its forward central region a rearwardly extending protrusion which is pierced by a simulated key slot, horizontal ribs on said protrusion, said ribs extending into said key slot, a pressure-sensitive adhesive on said flat rear surface, and a quick-release film covering said adhesive prior to use, the outer surface of said shell being brass plated.

4,084,418

DEVICE FOR CONTROLLING THE MANIPULATOR MOVEMENTS IN A FORMING MACHINE, IN PARTICULAR IN A HAMMER FORGING PRESS

Walter Willenbrock, Leverkusen, and Helmut Winkler, Meerbusch, all of Germany, assignors to Eumuco Aktiengesellschaft fur Maschinenbau, Leverkusen, Germany

Continuation of Ser. No. 368,324, Jun. 8, 1973, abandoned. This application Jun. 16, 1976, Ser. No. 696,808
Int. Cl.[2] B21D *43/10;* B21J *13/12*
U.S. Cl. 72—31 **11 Claims**

1. In a system for selectively establishing a program of forging a workpiece in which a workpiece is translated with re-

spect to a forging ram under control of a manipulator, the combination of:

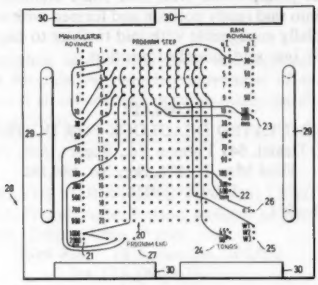
a contact field including a plurality of separate rows of contacts, a first group of contacts and at least one further group of contacts;

coder means having a plurality of output lines connected with said first group of contacts for producing patterns of signals of one value on said output lines in accord with the position of the manipulator;

a plurality of connectors selectively connected between said first group of contacts and a sequential set of said rows of contacts;

sequencing means for producing a sequence of signals;

first gate means for controlling said sequencing means to initiate said sequence of signals when all of the inputs from



said coder means as connected to a row are of said one value;

a plurality of further connectors selectively connected between said second group of contacts and selected ones of said set of rows;

data storage counter means having a plurality of output lines connected with said second group of contacts for producing signals of said one value in accord with the count stored therein;

a source of count storage pulses; and

second gate means connecting said source of count storage pulses to said counter means only in response to one of said sequence of signals for controlling said sequencing means to produce the next signal of said sequence when all of the inputs from said data storage counter means as connected to a row are of said one value.

4,084,419

METHOD FOR MANUFACTURING ANNULAR METAL WORKPIECES

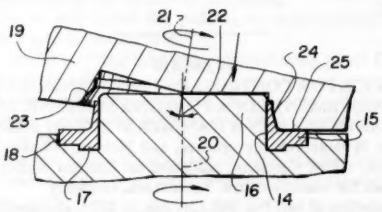
Erich Dittrich, and Siegfried Grone, both of Dortmund, Germany, assignors to Thyssen Industrie AG, Germany

Filed Mar. 7, 1977, Ser. No. 775,199

Claims priority, application Germany, Mar. 19, 1976, 2611568

Int. Cl.² B21H *1/06*

U.S. Cl. 72—68 **4 Claims**



1. A method of manufacturing annular metal parts having a deeply profiled cross-section, such as blank flanges, comprising heating a workpiece bloom to a forging temperature, upsetting and piercing the workpiece to form a pierced blank, roughing the pierced blank by applying a force acting at least on the outside and inside periphery of the blank while the blank is being rotated in order to form the blank into a ring having a substantially rectangular cross-section and an inside diameter which is equal to or slightly larger than the inside diameter of the finished part and, thereupon, rotating the ring and shaping it to the desired profile by directing a force on the front faces of the rotating ring and finish-rolling the ring to the final internal and external diameters of the part.

4,084,420

METHOD AND AN APPARATUS FOR PRODUCING A COILED SPRING

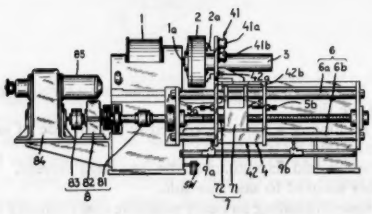
Takeyoshi Tsutsumino, Itamishi, Japan, assignor to Kabushiki Kaisha Taiheiseisakusho, Osakashi, Japan

Filed Oct. 8, 1976, Ser. No. 731,026

Claims priority, application Japan, Oct. 13, 1975, 50-123622

Int. Cl.² B21F *3/04*

U.S. Cl. 72—138 **5 Claims**



1. Apparatus for producing a coiled spring comprising:

(a) a rotatable coil supporter and means for rotating said coil supporter;

(b) means for supplying wire to said coil supporter including wire guiding means;

(c) said coil supporter including wire catching means for catching wire supplied to it;

(d) said wire guiding means being carried on an assembly movable along the axis of said coil supporter, movement of said assembly moving the position at which wire is supplied to said coil supporter;

(e) means for moving said assembly, said means including drive means which rotates a screw which is in engagement with a nut;

(f) said screw being rotatable independently of said means for rotating said coil supporter;

(g) opposed ends of said assembly being spaced along the axis of said screw and being engageable for movement by said nut;

(h) said nut being spaced from one said end whereby initial rotation of said screw will drive said nut without resulting in movement of said assembly;

(i) continued driving of said nut by said screw resulting in movement of said assembly with respect to the axis of said coil supporter; and

(j) a limit switch effective to stop rotation of said screw after a predetermined travel of said assembly.

4,084,421

APPARATUS FOR TWISTING AND GUIDING STOCK INTO ROLL GROOVES

Walter Johann Karlberger, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Dec. 7, 1976, Ser. No. 748,325

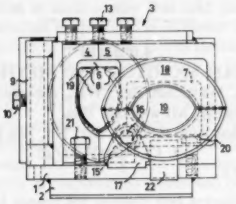
Claims priority, application Sweden, Dec. 10, 1975, 7513933

Int. Cl.² B21B *39/28*

U.S. Cl. 72—231 **2 Claims**

1. Apparatus for twisting and guiding stock into a roll groove, comprising guide means adapted to be mounted in

front of a said groove, said guide means comprising a funnel having a noncircular crosssectional shape of about the same size and shape as the stock to be fed, for receiving the end of stock passing toward the groove, said guide means having means defining a through path for said stock, means mounting said funnel for swinging movement about an axis parallel to said through path, between a first position in which said funnel is out of line with said through path and a second position in



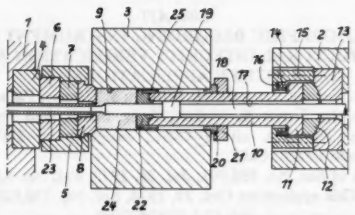
which said funnel is in line with said through path, and cam means disposed between said funnel and said means defining said through path for receiving the leading end of said stock emerging from said funnel when said funnel is in said first position and diverting said leading end into line with said through path, whereby said stock deflected by said cam causes said funnel to swing about said axis from said first position to said second position thereby to twist said leading end of said stock.

4,084,422

EXTRUSION PRESS

Franz Josef Zilges, Monchen-Gladbach, and Klaus Siegert, Berlin, both of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 22, 1975, Ser. No. 570,368
Claims priority, application Germany, Apr. 24, 1974, 2419709
Int. Cl.[2] B21C *23/04, 23/08*
U.S. Cl. 72—253 R **16 Claims**



1. An extrusion press for direct extrusion with shell, comprising a billet container,

a billet containing bore in the billet container,

a displaceable cross-head movable towards and away from the billet container,

a press stem mounted in the displaceable cross-head and movable along the billet containing bore spaced from the walls thereof when the cross-head is displaced towards and away from the bore,

means mounted on the billet container and separate and distinct therefrom for centering the press stem as it moves along said bore, and

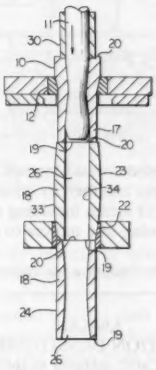
means articulately mounting said press stem for relative movement to and in the displaceable cross-head.

4,084,423

METHOD FOR FORMING A TRACK LINK BUSHING HAVING A CONTOURED OPENING

Charles H. Schlecht, York, Pa., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 3, 1976, Ser. No. 682,813
Int. Cl.[2] B21C *25/04, 25/08;* **B21D** *45/08*
U.S. Cl. 72—256 **10 Claims**



1. A method for forming a track pin bushing having a contoured opening and a generally cylindrical outer surface, comprising:

Step 1: Positioning a metal slug between a mandrel and a first ring die, said mandrel having an enlarged end portion and a double contoured middle portion;

Step 2: Urging the mandrel against the metal slug and through the first ring die for extruding the metal slug and forming a first metal blank having first and second ends and a generally cylindrical outer surface and a double contoured inner surface of preselected configuration;

Step 3: Passing the enlarged end portion of the mandrel through the blank while maintaining the outer walls of the blank free to expand outwardly for forming a generally cylindrical blank opening, moving outer walls of the blank outwardly and forming an outer surface of a preselected configuration in response to passing the mandrel through the blank; and

Step 4: Passing the first blank through a second ring die while maintaining the inner walls of the blank free to expand inwardly for forming a generally cylindrical blank outer surface, moving inner walls of the blank inwardly, and forming a second blank having a double contoured blank opening having a diameter progressing outwardly from a middle portion of the second blank toward each end of the second blank in response to passing the first blank through the second ring die.

4,084,424

TWIN MOTOR AND SCREW DRIVE FOR WORKPIECE POSITIONING STOPS AND FOR PRESS RAM DRIVE AND THE LIKE

Gerald V. Roch, and Chris L. Hadley, both of Indianapolis, Ind., assignors to Hurco Manufacturing Company Inc., Indianapolis, Ind.

Division of Ser. No. 630,011, Nov. 7, 1975. This application Aug. 6, 1976, Ser. No. 712,236
Int. Cl.[2] B21D *11/22, 7/06*
U.S. Cl. 72—389 **19 Claims**

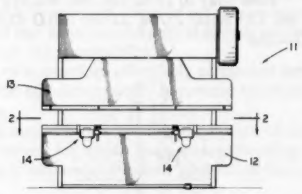
1. A gauging apparatus for presses and the like comprising:

frame means having first and second lead screws therein;

first and second screw drive motors, said first motor being coupled to said first screw for driving said first screw, and

said second motor being coupled to said second screw for driving said second screw;

first and second gauge mounting carriages coupled to said first and second screws respectively and linearly drivable thereby;



control means coupled to said motors for controlling the drive of said motors and thereby controlling drive of said screws, and control means including electric synchronizing means for causing said motors to drive said carriages in synchronism,

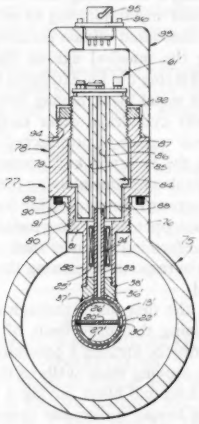
said control means including a microprocessor.

4,084,425

VIBRATION DENSITOMETER

Hyung Du Bae, Brea, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,963
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **2 Claims**



1. A vibration densitometer comprising: an electromechanical oscillator including a probe and a feedback circuit connected in a loop; a function generator connected from said feedback circuit; and utilization means connected from said function generator, said probe including inner and outer concentric cylinders fixed relative to each other, said outer cylinder having a hole extending radially therethrough, a shaft slidable through said hole in engagement with said inner cylinder, and means to vibrate said shaft in the direction of its axis to cause vibration of said inner cylinder, both cylinders being hollow completely therethrough, a diametral vane vibratable at least with said inner cylinder and having opposite ends fixed relative to said inner and outer cylinders, said cylinders having an interference fit, reduction in the diameter of one or both of said cylinders causing an increase in the longitudinal compression of said vane between said ends thereof, said interference fit producing a pressure on the said ends of said vane such that the sensitivity is substantially zero, where said sensitivity, S, is defined by

$$S = f_2 - f_1/f_1,$$

where

f_2 is a larger temperature vane vibrational frequency, and

f_1 is a smaller temperature or zero vibrational frequency, and where

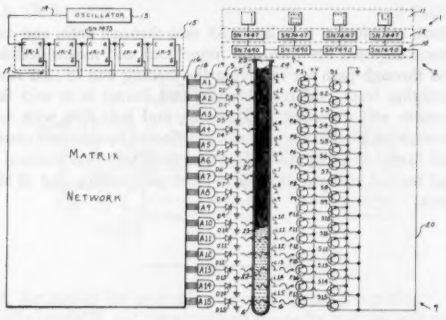
f_2 and f_1 are functions of the inside and outside diameters of said cylinders and the respective moduli of elasticity thereof.

4,084,426

FOAM MONITOR AND METHOD

Peter W. Gales, Whitefish Bay, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Aug. 6, 1976, Ser. No. 712,141
Int. Cl.² G01F *23/28*
U.S. Cl. 73—60.1 **15 Claims**



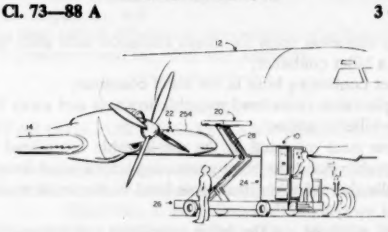
1. A foam monitor, comprising a container having an opening retaining a foam, means scanning said container opening at a plurality of vertically spaced levels and providing a first signal for each scanned level containing foam and a second signal for each scanned level void of foam, and means responding to said first and second signals provided by said scanning means and providing an output responsive to the dissipation of foam and indicative of the state of foam dissipation within said container.

4,084,427

HOLOGRAPHIC RECORDING INSTRUMENT FOR STRUCTURAL INTEGRITY VERIFICATION AND OTHER APPLICATIONS

Jerold L. Jacoby, Long Beach; William S. Tierney, Palos Verdes Peninsula; James E. Wright, Long Beach, and Pravin G. Bhuta, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 598,901, Jul. 24, 1975, Pat. No. 4,049,336.
This application Oct. 29, 1976, Ser. No. 736,923
Int. Cl.² G01M *7/00*
U.S. Cl. 73—88 A **3 Claims**



1. A holographic recording instrument comprising:

holographic recording means including a pulsed laser for recording on the same holographic recording medium

two successive holograms of a structure of interest by operating the laser to emit two short laser pulses in rapid succession, and a shutter for controlling light passage to said recording medium,

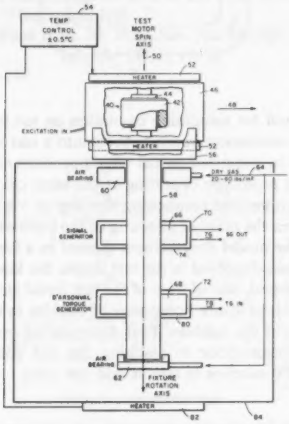
an impulser including a plunger and means for driving said plunger into impact with said structure for impulsively loading said structure to generate stress waves which propagate through and create varying stress conditions in the structure, and

means for operating said shutter, loading means, and laser in timed relation in such a way that said laser pulses occur while said shutter is open and in different timed relation to the propagation of said stress waves through the structure to record on said recording medium a first hologram of said structure while the latter is in one stress condition and a second hologram of said structure while the latter is in another stress condition, said operating means comprising means for actuating said shutter to momentarily open the shutter, means for sensing and actuating said plunger driving means in response to a selected condition of said shutter, and means for sensing and actuating said laser in response to movement of said plunger by said plunger driving means.

4,084,428
TORQUE REACTION MOTOR PERFORMANCE EVALUATION

Byong-Ho Ahn, Wayland; Philip J. Gilinson, Jr., Chelmsford, and Anthony Michael Moscaritolo, Saugus, all of Mass., assignors to Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 12, 1977, Ser. No. 796,151
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.3 **29 Claims**



1. A process for analyzing the motor characteristics of an electrical motor mounted within and energizable through a housing which is mounted in a rotation mount for rotation about an axis other than orthogonal to the motor spin axis, said process comprising the steps of:

applying an energization signal to said motor to produce rotation of the rotor thereof about its spin axis;

sensing rotation of said housing from a predetermined position with respect to said mounting to provide a rotation signal;

generating a restraint signal representative of said rotation signal;

restraining the rotation of said housing in response to said restraint signal against rotation from a predetermined position;

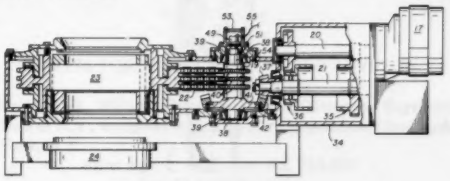
providing a signal representative of motor speed;

providing an indication of a plurality of motor performance characteristics in response to said restraint signal and said speed representing signal.

4,084,429
POWER TONG APPARATUS

John Gordon Boland, Wichita Falls, Tex., assignor to Foster Cathead Corporation, Houston, Tex.

Filed May 3, 1976, Ser. No. 682,574
Int. Cl.² B25B *23/14*; G01L *5/24*
U.S. Cl. 73—139 **1 Claim**



1. An apparatus for making or breaking connections between tubular members, comprising:

means for supplying motive forces;

an internally mounted transfer shaft coupled to the means for supplying motive forces whereby the motive forces are transformed into high-torque forces;

means coupled to the transfer shaft for transmitting the high-torque forces of the transfer shaft to the tubular members;

a slip ring assembly for conducting electrical signals secured to a selected end of the transfer shaft; and

means associated with the internally mounted transfer shaft for determining the torque experienced by the transfer shaft whereby the torque applied by the apparatus to the tubular members is determined accurately independent of the physical constraints and mounting of the apparatus, such torque determining means including:

two holes counterbored in the transfer shaft diametrically opposite each other and a passage bored in the longitudinal axis of the transfer shaft providing communication between the two counterbored holes and the end of the transfer shaft onto which the slip ring assembly is secured;

a strain gauge installation is secured to the transfer shaft in each of the holes for transducing the angular deformation for the transfer shaft into an electrical signal representative thereof; and

electrical conductors extend from the counterbored holes and through the passage and connect each strain gauge installation to the slip ring assembly for conducting the electrical signal external of the transfer shaft whereby the torque experienced by the transfer shaft can be externally displayed.

4,084,430
LOAD MEASUREMENT

Henry Bryant Boyle, Laleham, and Alexander James Johnson, Greyshott, both of England, assignors to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the, London, England

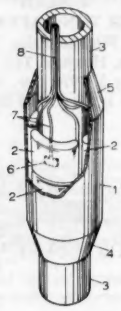
Filed Sep. 9, 1976, Ser. No. 721,860
Claims priority, application United Kingdom, Sep. 10, 1975, 37303/75
Int. Cl.² G01L *1/02*
U.S. Cl. 73—141 R **11 Claims**

1. A device for measuring an externally applied load on a structural member, comprising:

one or more flexible fluid-filled cells;

means for sensing the fluid pressure within the or each cell or the relative fluid pressures within different cells; and

a flexible casing for constraining the or each cell between itself and the surface of the structural member the load on which is to be measured, said casing being adapted to



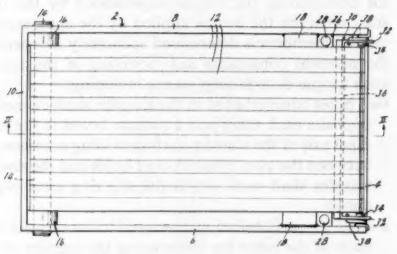
surround the structural member and to transmit the whole of the externally applied load to said surface solely through the fluid within the or each cell, the pressure of said fluid thereby varying with said load.

4,084,431

TIRE INFLATION GAUGE

Jack C. Newby, 113 S. Oak St., Eureka, Kans. 67045

Filed Feb. 9, 1977, Ser. No. 766,925
Int. Cl.² B60C *23/06*
U.S. Cl. 73—146.2 **5 Claims**



1. An inflation gauge for a vehicle tire operating on a principle that the tread face of said tire will tend to assume a transversely convex curvature if over-inflated, a transversely concave curvature if under-inflated, and a transversely straight configuration if properly inflated, said gauge comprising:

a. a frame,

b. a series of elongated tread bars all pivoted coaxially at one end in said frame and extending generally horizontally from said pivot in side by side relation, whereby the upper surfaces thereof in aggregate form a treadway for supporting the weight of a tire positioned thereon with its vertical plane parallel to the longitudinal extent of said tread bars, the transverse width of each tread bar being a small fraction of the tread width of the tire and the aggregate width of said tread bars being at least as great as the tread width of the tire, and

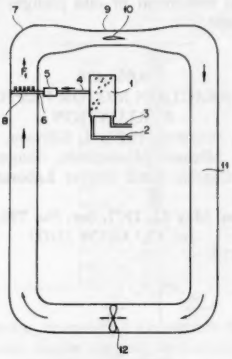
c. resiliently yieldable means supporting the end of each of said tread bars opposite from its pivot, and operable to support all of said tread bars at equal elevations when not loaded by a tire, whereby said treadway is substantially planar, and being of equal elastic moduli whereby all of said tread bars will be equally depressed by equal tire weights imposed thereon, as a result of which said tread bars will be unequally depressed by an improperly inflated tire supported on said treadway, the pattern of said unequal depression indicating the nature of the improper inflation, said treadway being of sufficient length to support the entire road-engaging surface of said tire intermediate the ends thereof, whereby the proportion of the weight imposed by said tire on said tread bars which is supported by said resiliently yieldable means may be varied by centering said tire relatively closer to or further from the ends of said bars supported by said resiliently yieldable means.

4,084,432

METHOD OF SIMULATING CAVITATION BY HYDRAULIC TESTING

Yves Lecoffre, Echirolles, France, assignor to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A., Paris, France

Filed Jan. 26, 1977, Ser. No. 762,595
Claims priority, application France, Feb. 10, 1976, 76 03616
Int. Cl.² G01M *10/00*
U.S. Cl. 73—148 **2 Claims**



1. A method for simulating cavitation on models including the step of introducing micro-bubbles into a test liquid stream upstream of an immersed model which produce effects similar to those of a prototype operating at the same cavitation number, the improvement comprising the step of varying the distance between the point of injection of the bubbles into the test liquid and the model downstream thereof as a function of the quantity of gas dissolved in the test liquid, the kind of gas, the kind of test liquid, rate of flow of the test liquid and pressure of the test liquid, to insure homogeny of bubbles in the test zone and to prevent the bubbles from disappearing completely by gaseous diffusion prior to reaching the test zone and from exceeding 200 microns in size at said test zone.

4,084,433

METHOD AND APPARATUS FOR QUANTITATIVELY AND QUALITATIVELY DETERMINING THE DUST CONTENT OF FIBROUS MATERIAL

Willem J. Naarding, Stad Delden, Netherlands, assignor to Hergeth KG Maschinenfabrik und Apparatebau, Dulmen, Germany

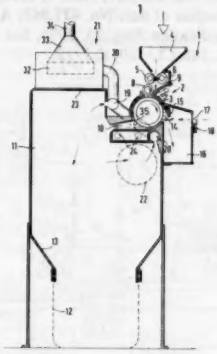
Filed Sep. 30, 1976, Ser. No. 728,055
Claims priority, application Germany, Oct. 4, 1975, 2544563
Int. Cl.² G01N *5/00*
U.S. Cl. 73—159 **17 Claims**

1. A method for determining the content of fine dust contained in a given amount of fibrous material, which fine dust is detrimental to open-end spinning, which comprises the steps of:

(a) opening said given amount of fibrous material to provide individual fibers and fine dust released therefrom;

(b) entraining the individual fibers and fine dust in a flow of

air and subjecting the individual fibers and fine dust to constriction while thus entrained;
(c) separating said fine dust from said individual fibers;
(d) collecting said individual fibers;



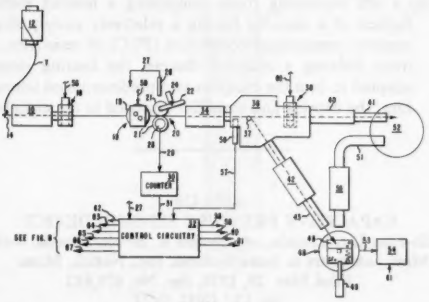
(e) collecting said fine dust; and
(f) weighing the collected individual fibers and collected fine dust.

4,084,434

APPARATUS FOR DETERMINING DENIER OF YARN

Lewis Charles Goodrich, Wilmington; Theron Robert Holt, Newark; Joseph Cyril Osborne, Wilmington, all of Del.; Donald Kirk Pusey, West Grove, Pa., and James William Roxlo, Rockaway, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1977, Ser. No. 782,325
Int. Cl.[2] D01H *13/32*
U.S. Cl. 73—160 **4 Claims**



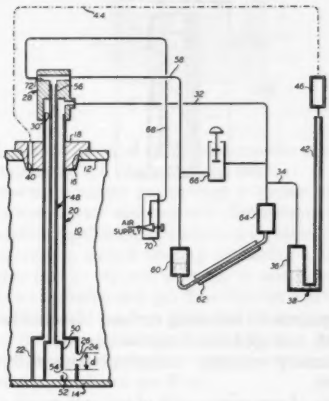
1. In an apparatus for determining denier of yarn that includes a source of supply of said yarn, a scale for weighing a measured length of said yarn, and a transport system for measuring and transferring said measured length of yarn from said source of supply to said scale, a yarn diverter to permit stripping of said source of supply to a waste receptacle and transferring said measured length of yarn to said scale in a continuous operation, said yarn diverter comprising: a block positioned between said transport system, said waste receptacle and said scale, said block having a through passage aligned with said transport system and said waste receptacle and a branch passage leading from an intermediate location on said through passage toward said scale, said through passage having inlet and outlet ends; means for cutting said yarn between said intermediate location and said outlet end; and means for aspirating said through passage both at its inlet and outlet end and said branch passage at its outlet end according to a preselected operating mode that provides for directing said yarn to said waste receptacle and then to said scale without stopping movement of said yarn.

4,084,435

SYSTEM FOR MEASURING WATER LEVEL IN GASOLINE TANK

Edward Weik, Williston Park, and Roger Thomson, Bayshore, both of N.Y., assignors to Petrometer Corporation, New Hyde Park, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,680
Int. Cl.[2] G01F *23/14*
U.S. Cl. 73—299 **9 Claims**



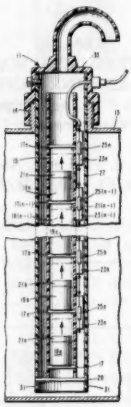
1. A system for measuring the water level within a predetermined range at the bottom of a tank containing gasoline comprising,
(a) a first air bell adapted to be inserted into said tank and having an opening in the lower part thereof to define a first interface,
(b) a second air bell adapted to be inserted into said tank and having an opening in the lower part thereof to define a second interface which is lower than said first interface,
(c) a manometer containing liquid between opposite legs thereof,
(d) one leg of said manometer being in communication with the upper end of said second air bell for transmitting the hydrostatic pressure at said second interface to said one leg, and the other leg of said manometer being in communication with the upper end of said first air bell for transmitting the hydrostatic pressure at said first interface to said front leg, causing displacement of manometer liquid as a function of the pressure difference between said interfaces, whereby said displacement is a function of the water level between said interfaces, there being minimum displacement when said water level is at said second interface and maximum displacement when said water level is at said first interface,
(e) the upper end of said first air bell being in communication with the rear leg of another manometer whose front leg is vented whereby the liquid displacement in said another manometer is a function of the gasoline level in said tank when the latter is vented.

4,084,436

FUEL OIL LEVEL MEASURING APPARATUS

Ray C. Smitherman, Spencer, N.C., assignor to RTR Incorporated, Spencer, N.C.

Filed Dec. 1, 1975, Ser. No. 636,758
Int. Cl.[2] G01F 23/12
U.S. Cl. 73—313 7 Claims



1. An apparatus for indicating the level of fuel oil in a fuel oil storage tank, said apparatus comprising:

a substantially vertically extending substantially straight conduit;

a plurality of stop means, each of said stop means extending inwardly from the interior wall of said conduit, said stop means being spaced from each other along said conduit;

a plurality of floats positioned in said conduit, each float being positioned between a respective pair of next adjacent ones of said plurality of said stop means;

a plurality of magnets each of which is mounted on a respective one of said floats;

a plurality of reed switches electrically connected in series to each other, each of said reed switches being mounted on the exterior of said conduit immediately adjacent and having a portion vertically coextensive with a respective one of said stop means;

a plurality of resistors electrically connected in series to each other, each of said resistors being electrically in parallel with a respective one of said plurality of reed switches; and

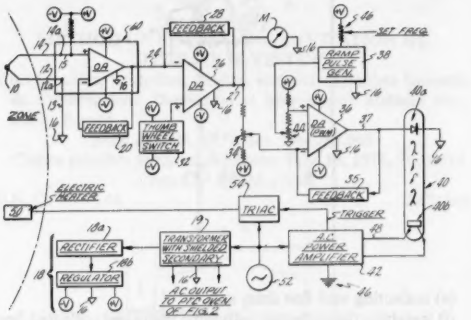
a meter electrically connected to said reed switches and said resistors so that as the level of fuel oil in a fuel oil storage tank in which said conduit is positioned, rises, each of said floats and magnets thereon successively, from the lowermost to the uppermost, rises and actuates the reed switch adjacent one of the two stop means between which it is positioned whereby said meter can indicate that the level of fuel oil is adjacent that reed switch and as the level of fuel oil falls, each of said floats and magnets thereon successively, from the uppermost to the lowermost, falls and deactuates the reed switch adjacent one of the two stop means between which it is positioned whereby said meter can indicate that the level of fuel oil is no longer adjacent that reed switch.

4,084,437

THERMOCOUPLE CIRCUIT

Francis Finnegan, Wrentham, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 629,937, Nov. 7, 1975, abandoned, which is a continuation of Ser. No. 427,863, Apr. 2, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,750
Int. Cl.[2] G01K 7/12
U.S. Cl. 73—361 5 Claims



1. A thermocouple circuit comprising

(a) a pair of dissimilar conductors adapted to extend into a zone, the temperature of which is to be monitored, the pair of conductors having ends and opposite ends,

(b) a transducer defined by the ends of said dissimilar conductors,

(c) an operational amplifier coupled to the opposite ends of said conductors,

(d) a disk like capsule of thermally conductive material, said opposite ends of said conductors embedded in said capsule disposed adjacent to the operational amplifier in heat transfer relation thereto, and

(e) a self regulating oven comprising a heating element formed of a material having a relatively steeply sloped positive temperature coefficient (PTC) of resistivity, the oven defining a chamber therein, the heating element adapted to heat the chamber to a predetermined temperature, the capsule and amplifier disposed in the chamber.

4,084,438

CAPACITIVE PRESSURE SENSING DEVICE

Shih-Ying Lee, Lincoln, and Dennis K. Briefer, Berlin, both of Mass., assignors to Setra Systems, Inc., Natick, Mass.

Filed Mar. 29, 1976, Ser. No. 671,612
Int. Cl.[2] G01L 9/12
U.S. Cl. 73—706 33 Claims

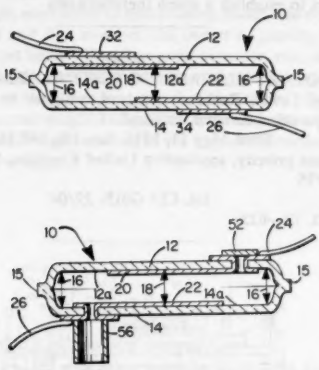
1. A pressure sensing device comprising:

A. a pair of dielectric disc elements, each having at least one nominally planar surface peripherally bounded by a predetermined curve, said disc elements being fused together at their peripheral boundary to form a hollow monolithic capsule having nominally planar opposed inner surfaces, wherein said opposed inner planar surfaces are mutually separated by a uniform, predetermined gap near said peripheral boundary and by a distance related to the difference in pressure exterior and interior to said capsule otherwise, and wherein said capsule includes inner conductive film members disposed on opposed portions of said opposed inner surfaces, and

B. coupling means for electrically coupling said inner film members to conductive terminal elements exterior to said capsule,

wherein the outer surface of said capsule has an outer conduc-

tive film member disposed on a portion thereof opposite each inner conductive film member, each of said outer conductive



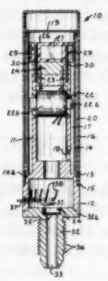
film members being in good electrical contact with one of said terminal elements.

4,084,439

PRESSURE TRANSDUCER WITH CAPACITOR PICK-UP MEANS

Robert D. Teter, Olathe; James W. Maddock, Merriam, and Paul L. Rothers, Gardner, all of Kans., assignors to King Radio Corporation, Olathe, Kans.

Continuation of Ser. No. 618,395, Oct. 1, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,075
Int. Cl.² G01L *9/12*
U.S. Cl. 73—718 **2 Claims**



1. A method of producing an electric signal indicative of the pressure differential between a fluid and a reference pressure, said method comprising the steps of:

providing a vibrational membrane;

maintaining said reference pressure on one side of said membrane;

bringing said fluid into contact with the other side of said membrane;

effecting vibration of said membrane in the fifth order vibrational mode thereof;

locating five capacitor plates at spaced positions in proximity to said membrane to cooperate therewith in providing a capacitor to sense the vibrations of said membrane; and

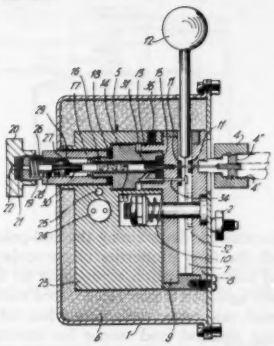
producing an oscillatory output signal from said capacitor corresponding in frequency to the vibrational frequency of said membrane, said output signal thereby being related to the pressure differential between said fluid and said reference pressure.

4,084,440

CHROMATOGRAPH INJECTION SYSTEM

Wilfred C. Carpenter, Ralston; Gary N. Schmitz, and Walter J. Fenrick, both of Medicine Hat, all of Canada, assignors to Her Majesty in Right of Canada as Represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 4, 1976, Ser. No. 729,382
Claims priority, application Canada, Mar. 31, 1976, 249316
Int. Cl.² G01N *1/22*
U.S. Cl. 73—422 GC **20 Claims**



16. A method for rapid quantitative transfer of a sample into a gas chromatograph comprising the steps:

(a) flowing a carrier gas through a bypass passage in an injection device and into said chromatograph until substantially equilibrium conditions are attained;

(b) inserting a sample housing containing a sample to be tested into an isolated chamber in said injection device while continuing said gas flow through said bypass; and

(c) diverting said gas flow from said bypass passage so as to pass through said sample housing thereby desorbing and transferring said sample to said chromatograph without interruption of said gas flow.

4,084,441

DEVICE FOR OBTAINING A SAMPLE OF MOLTEN MATERIAL AND DEOXIDIZING ELEMENT FOR USE THEREWITH

Robert F. McDevitt, Ogden Dunes, Ind., assignor to Charles S. Penfold, Fort Wayne, Ind.

Division of Ser. No. 720,697, Sep. 7, 1976. This application Apr. 29, 1977, Ser. No. 792,340
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.4 R **12 Claims**

12. A deoxidizing means adapted for use in a device for obtaining a sample of molten metal, said means comprising a piece of metal which is formed into a generally cylindrical structure for contraction and expansion when placed in a tube of such a device.

4,084,442

CONTROL OF PROCESSES

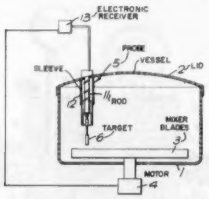
David Kay, Castle Donnington, England, assignor to The Boots Company Limited, England

Filed Nov. 24, 1976, Ser. No. 744,895

Claims priority, application United Kingdom, Nov. 27, 1975, 48907/75

Int. Cl.² G01N *15/00*

U.S. Cl. 73—432 PS **11 Claims**



1. An apparatus for determining the end-point of an operation in which the flow properties of particulate material are being altered during agitation comprising an agitation vessel provided with agitation means and a probe extending into the agitation vessel, said probe deflecting when hit by particulate material being agitated, and means for detecting when the amplitude and/or frequency of the deflections of the probe changes to a given level.

4,084,443

ACCELEROMETERS

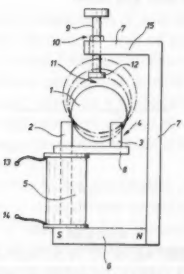
Derek Oscar Walter, London, England, assignor to Johnson, Matthey & Co., Limited, London, England

Filed Mar. 25, 1977, Ser. No. 781,453

Claims priority, application United Kingdom, Mar. 30, 1976, 12748/76

Int. Cl.² G01P *15/08*

U.S. Cl. 73—517 R **5 Claims**



3. An accelerometer including at least one body, a plurality of supports for supporting the body in a state of stable equilibrium except when the accelerometer is subjected to an acceleration exceeding a threshold value wherein movement of the body relative to the supports causes a change in a physical parameter of the accelerometer and wherein the body is of generally mushroom shape having a head and a stem and the accelerator also comprises an annular parmanent magnetic element or an annular permanent magnetisable element, three substantially parallel and equally spaced core members carried by the said element and each having an associated solenoid, one end of each core constituting one of said supports for the body so that when at rest, the stem is located in a space within the solenoids and passes with clearance through the said annular element, the head is supported on the three supports constituted by the ends of the cores, and undisturbed flux linkages exist in magnetic circuits between the individual solenoids or portions of the said annular element a spacial gap between the annular element and the stem, the head and the appropriate core, the flux changing when the accelerometer is subjected to an acceleration which dislodges the head from at least one support to establish a space therebetween.

4,084,444

ROTARY ULTRASONIC TESTING APPARATUS

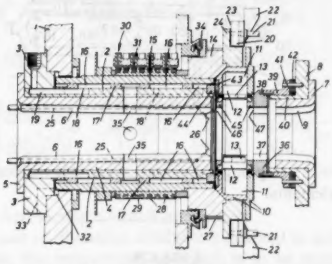
Richard Lewis, Rushden, England, assignor to British Steel Corporation, London, England

Filed May 11, 1976, Ser. No. 685,158

Claims priority, application United Kingdom, May 13, 1975, 20149/75

Int. Cl.² G01N *29/04*

U.S. Cl. 73—622 **6 Claims**



1. In a rotary ultrasonic testing apparatus comprising an annular stator; a replaceable annular ultrasonic probe assembly mounted for rotation on the stator; first and second fixed replaceable annular guideways for the articles to be tested located one on each side of the probe assembly, said guideways having internal configurations arranged to conform to the cross-section of the article to be tested and provide a close tolerance guide therefor, the improvement wherein the internal dimension of said guideways adjacent said probe assembly is smaller than the internal dimension of said probe assembly and said guideways each have an end surface adjacent the probe assembly which serve as radially inwardly extending side walls immediately adjacent the opposite sides of the probe assembly.

4,084,445

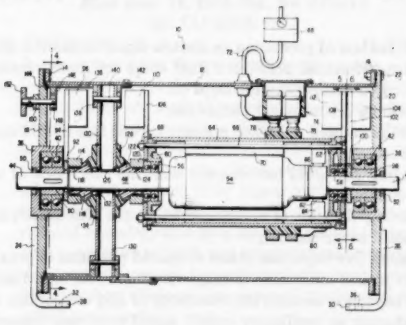
CONTRA-ROTATING VIBRATOR

Arthur F. Erwin, 305 Woodland La., Oconomowoc, Wis. 53066

Filed Dec. 11, 1975, Ser. No. 639,773

Int. Cl.² F16H *33/00*

U.S. Cl. 74—61 **18 Claims**



1. A device for producing vibratory motion, comprising:
a frame;
a motor carried by said frame comprising first and second

members which impose reactive forces on one another and which rotate in opposite directions about a common axis in response to said forces;

a first weight connected to and rotating about said common axis with said first member, the center of gravity of said first weight being offset from said common axis; and

a second weight connected to and rotating about said common axis with said second member, the center of gravity of said second weight being offset from said common axis, said second weight rotating in the opposite direction from said first weight.

4,084,446

VIBRATORY MACHINE

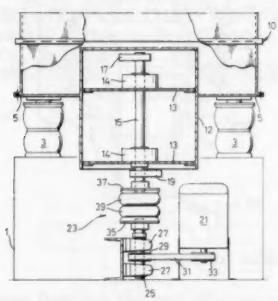
George Terah Gough, Newcastle, England, assignor to Gough & Company (Hanley) Limited, Stoke on Trent, England

Filed Jun. 14, 1976, Ser. No. 695,819

Claims priority, application United Kingdom, Jun. 17, 1975, 25750/75

Int. Cl.[2] F16H *33/00*

U.S. Cl. 74—61 9 Claims



1. A vibratory machine comprising a support frame, at least one flexible suspension device supported on said support frame, a vibratable member supported by said at least one suspension device, an output shaft for vibrating said vibratable member, at least one bearing means connecting said output shaft to said vibratable member and at least one out-of-balance weight carried by said output shaft and rotatable thereby about the longitudinal axis of said output shaft, an input shaft, at least one bearing rotatably mounting said input shaft on the support frame, drive means coupled to said input shaft for rotating said input shaft, and a flexible resiliently deformable member said deformable member having a second end connected to said output shaft, said flexible resiliently deformable member defining coupling means for rotationally coupling said input shaft to said output shaft without transmitting other movements of said output shaft to said input shaft, there being two of said out-of-balance weights adjustably mounted on said output shaft one adjacent each end of the shaft, said bearings mounting said input shaft in line with said output shaft, and said drive means including a belt pulley mounted on said input shaft and a drive belt connecting said belt pulley to a power source which comprises a motor mounted on the machine frame, said bearings mounting said input and output shafts for rotation about a common vertical axis, two transverse plates connected to said vibratable member, and there being two of said bearing means, said two bearing means being vertically spaced heavy duty bearings connecting said output shaft to said transverse plates.

4,084,447

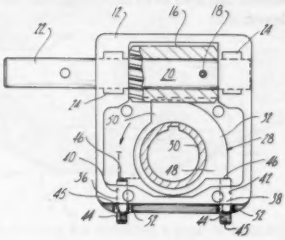
VALVE ACTUATOR

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed Apr. 1, 1976, Ser. No. 672,839

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.14 4 Claims



1. A valve actuator for use with a valve having an actuator shaft the rotation of which actuates the valve, said valve actuator comprising

a housing,

a worm gear mounted for rotation in said housing, said worm gear having a shaft portion extending externally of said housing,

a segmented gear mounted for rotation in said housing along an axis substantially perpendicular to and spaced from the axis of rotation of said worm gear so that said segmented gear meshes with said worm gear,

means for securing said actuator shaft to said segmented gear, and

two elongated stop members threadably engaged in threaded bores in said housing so that the longitudinal axis of each stop member is substantially perpendicular to rotational axis of said segmented gear and so that a first axial end of each stop member is accessible exteriorly of said housing while the second axial end of each stop member is positioned interiorly of said housing whereby the axial position of the second axial ends of said stop members can be adjusted by rotation of said stop members, and wherein the second end of one stop member is adapted to abut against one of the outer teeth of said segmented gear at the extreme rotational travel of said segmented gear in one direction to thereby limit the rotation of said segmented gear in said last mentioned direction, and wherein the second end of the other stop member is adapted to abut against the other outer tooth of said segmented gear at the extreme rotational travel of said segmented gear in the other direction to thereby limit the rotation of said segmented gear in the last mentioned direction.

4,084,448

ESCAPEMENT ASSEMBLY FOR SHIFT CONTROL MECHANISM

Robert W. Wolfe, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 23, 1977, Ser. No. 771,230

Int. Cl.[2] G05G *5/12, 7/00*

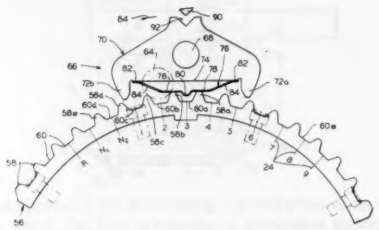
U.S. Cl. 74—475 20 Claims

1. In a transmission shift control mechanism having a main housing, means for shifting a transmission, and a shift lever, movable in an arc, for controlling said shifting means through a plurality of settings corresponding in number to the number of in-gear and neutral positions of said transmission, wherein the improvement takes the form of an escapement assembly comprising:

a. a control member mounted on said housing, said control member having an arcuate surface provided with a plurality of spaced detent cut-outs corresponding to the location

of said in-gear and neutral positions of said transmission and in number exceeding said number of in-gear and neutral positions;

b. an escapement latch pivotally secured to said shift lever, each end of said escapement latch including a depending portion, one or the other of which, depending on the direction of movement of said shift lever, is capable of entering into one of said detent cut-outs, upon pivoting of said escapement latch so as to inhibit further movement of said shift lever; and



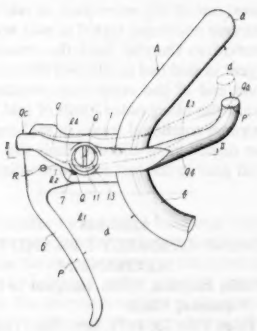
c. bias means operatively interposed between said control member and said escapement latch for sequentially pivoting and then again centering said escapement latch relative to said control member for each of said in-gear and neutral positions of said tranmission, whereby all but the slowest movement of said shift lever will cause a momentary entry and subsequent momentary interference between said escapement latch and one of said detent cut-outs, thereby producing sequential single-step shifts of said transmission.

4,084,449

BRAKE LEVER FOR A BICYCLE

Masayoshi Kine, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 23, 1976, Ser. No. 708,113
Claims priority, application Japan, Aug. 1, 1975, 50-107780
Int. Cl.[2] G05G *11/00*; B62K *23/06*; B62L *3/02*
U.S. Cl. 74—480 R **5 Claims**



1. A brake lever means mounted on a drop type bicycle handle comprising a straight rod section and a substantially U-shaped bent rod section extending downward and forward from the straight rod section, said brake lever means comprising:

a bracket means fixed to said bent rod section of the drop type handle;

a lever spindle;

a main lever pivotally mounted above a first axis to said bracket means through said lever spindle, said main lever being substantially parallel to said bent rod section;

a wire retainer on said main lever for retaining one end of a control wire for controlling a brake of the bicycle;

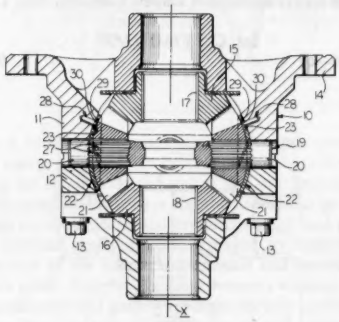
an auxiliary lever pivotally mounted about a second axis to one side outer surface of said bracket means, said second axis being more remote from said wire retainer than said first axis of said main lever, said auxiliary lever being engagable with said main lever to actuate same, whereby the bicycle brake is operable by both said levers, and the position of said second axis is changeable so that the distance between said auxiliary lever and said straight rod section of the drop type handle may be adjusted.

4,084,450

THRUST WASHER ARRANGEMENT FOR DIFFERENTIALS

William E. Conroy, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 27, 1976, Ser. No. 727,190
Int. Cl.[2] F16H *1/40*
U.S. Cl. 74—713 **7 Claims**



1. A differential comprising

a housing,

a spider comprising at least one stub shaft mounted on said housing,

a pinion gear rotatably mounted on said stub shaft,

a thrust washer disposed between an outboard side of said pinion gear and said housing,

means defining a closed and elongated slot through said thrust washer, said slot disposed entirely within the confines of said thrust washer and further disposed adjacent to an edge thereof, and

a pin having a first end thereof secured to said housing and a second end thereof disposed in the slot defined through said thrust washer.

4,084,451

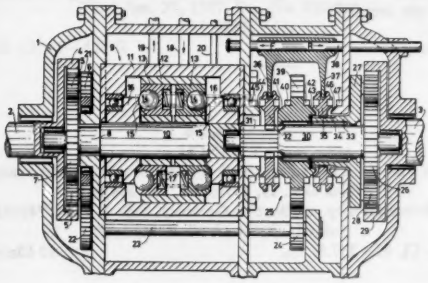
DRIVE-TRANSMITTING MECHANISMS

John Lionel Raymond Ward, Ivy Rock, Tidenham, Chepstow, Gwent, Wales

Filed Dec. 9, 1976, Ser. No. 748,890
Claims priority, application United Kingdom, Jul. 2, 1976, 50335/76; Jul. 23, 1976, 27755/76; Jul. 23, 1976, 30911/76
Int. Cl.[2] B60K *41/04*; F16H *37/06*
U.S. Cl. 74—867 **13 Claims**

1. A drive-transmitting arrangement comprising a gear assembly having an input member and two output members, wherein one of the output members is connected to the operating element of a hydraulic pump and valve means is provided in the outlet line of the hydraulic pump, which valve means is

adjustable to adjust the resistance to movement of the operating element of the hydraulic pump and thereby to adjust the



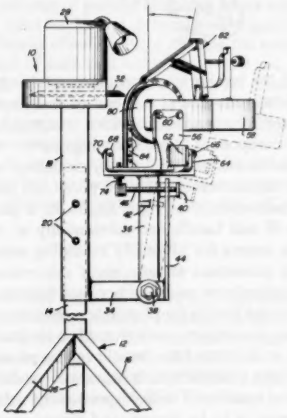
ratio between the rates of rotation of the input member and the other output member.

4,084,452

OSCILLATING SAW CHAIN SHARPENER

Jack F. Simington, Chiloquin, Oreg., assignor to Simington Products Co., Chiloquin, Oreg.

Filed Nov. 10, 1976, Ser. No. 740,718
Int. Cl.² B23B *63/16*
U.S. Cl. 76—42 **7 Claims**



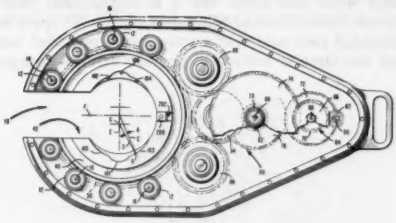
1. In combination, a a support from which a drivable rotary grinding wheel is journaled for rotation about a first predetermined axis, a mount, support means supporting said mount from said support for guided back and forth shifting relative to said support toward and away from the outer periphery of said grinding wheel along a predetermined path extending at least generally radially of said axis and for limited oscillation of said mount about a second axis generally paralleling said first axis, said mount including means operative to support a length of saw chain therefrom, said support means including a mounting arm having one end pivotally supported from said support for rotation about a third axis generally normal to said first axis, said mount being supported from the other end of said mounting arm.

4,084,453

POWER TONGS

Emery Lee Eckel, Odessa, Tex., assignor to Eckel Manufacturing Co., Inc., Odessa, Tex.

Filed Mar. 30, 1976, Ser. No. 671,959
Int. Cl.² B25B *17/00*
U.S. Cl. 81—57.18 **9 Claims**



1. A power tong for rotating a pipe of selected outside diameter to make up or break apart a threaded joint comprising a frame having a throat for receiving a pipe, a partial ring rotatably mounted on said frame about a center of rotation defining a first reference point and having an opening therein which is adapted to be aligned with said throat so that a pipe may be positioned within said partial ring, said partial ring defining first and second cam surfaces positioned on opposite sides of the center line of said opening, said first and second cam surfaces each including a neutral cam surface and two gripping cam surfaces, said neutral cam surface of said first and second cam surfaces being radially outwardly of said two gripping cam surfaces of said first and second cam surfaces, respectively, relative to said center line of said opening to permit said pipe to be positioned in said opening, said two gripping cam surfaces of said first and second cam surfaces forming portions of circles whose centers are at second reference points lying between said first reference point and said neutral cam surface of said first and second cam surfaces, respectively, said second reference points lying on a line which is perpendicular to the center line of said partial ring and passes through said first reference point, means for rotating said partial ring about said center of rotation, and die means operatively associated with said partial ring, said die means having a size and radius of curvature corresponding to said selected outside diameter of said pipe and including dies and cam followers positioned on opposite sides of said center line of said opening, said cam followers being received in said neutral cam surfaces when said power tong is in its neutral position so that said dies are out of gripping engagement with said pipe, said cam followers being adapted to move along said gripping cam surfaces to move said die means inwardly so that said dies grip said pipe on opposite sides thereof on rotation of said partial ring, the position of said cam followers along said gripping cam surfaces when said dies grip said pipe defining third reference points, first and second lines originating at said first and second reference points, respectively, and terminating at said third reference points relative to each of said first and second cam surfaces defining a cam angle of about $\frac{1}{4}°$ to $5\frac{1}{4}°$ whereby rotation of said partial ring causes said dies to grip said pipe at said cam angle for turning movement of said pipe to make up or break apart a threaded joint.

4,084,454

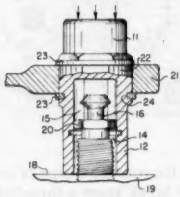
SOCKET HEAD TOOL

Leon E. Day, West Memphis, Ark., assignor to Polygon, Inc., Essex, Conn.

Filed Jan. 8, 1976, Ser. No. 647,649
Int. Cl.² B25B *13/48*
U.S. Cl. 81—121 R **2 Claims**

1. A tool for loosening a frozen threaded part of the type which is screw-threaded into a work-piece and has a unitary turning head freely exposed outwardly of a surface of the

work-piece, said tool comprising a generally cup-shaped, elongated socket tool body having means for receiving hammer-like blows, said means comprising a solid upper axial head and an axially downwardly extending hollow skirt portion below said head terminating in a peripheral lower rim, said skirt portion having an internal depth greater than the height of the work-piece head above the work-piece to completely house the head when said lower rim is in engagement with said work-piece, said solid head being spaced from the upper end of said threaded part, said skirt portion being provided with an internal non-circular surface to provide driving engagement

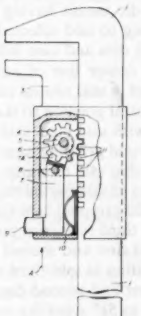


with the gripping portions of the threaded part, said tool socket body having non-circular outer surface axially intermediate said upper head and said lower rim for engagement by a complementary non-circular opening of a wrench but slidable axially relative to the wrench, whereby, with said tool socket body positioned over the head of said threaded part and with its lower rim resting on said work-piece, application of hammer-like blows to said solid upper axial socket head produces jarring forces passing from said upper head through the skirt to the work-piece without substantial transfer of said forces to the threaded part and to the wrench.

4,084,455
ADJUSTABLE WRENCH

Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed Sep. 2, 1976, Ser. No. 719,934
Int. Cl.[2] B25B *13/14*
U.S. Cl. 81—140 **9 Claims**

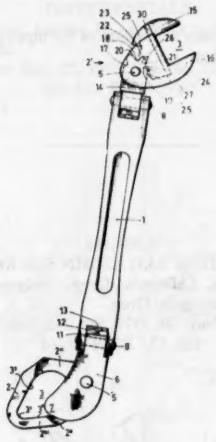


1. An adjustable wrench comprising;
a pair of jaws,
means for supporting the jaws for relative movement therebetween to open and close the jaws,
teeth on one of said jaws disposed along a linear track,
an annular pinion gear associated with the other of said jaws,
annular, uni-directionally rotatable means for supporting the pinion gear permitting rotation of the pinion gear in only one direction,
means for supporting said uni-directionally rotatable means,
actuating means coupled to said means for supporting said uni-directionally rotatable means for pivoting said pinion gear away from the teeth,
and means for biasing the pinion gear into engagement with the teeth.

4,084,456
WRENCH

Max Pasbrig, Casa Luce, via Eco, 6644 Orselina, Switzerland

Filed Dec. 19, 1974, Ser. No. 534,641
Claims priority, application Germany, Feb. 1, 1974, 7403522
Int. Cl.[2] B25B *13/00*; B25G *1/00*
U.S. Cl. 81—177.8 **10 Claims**



1. A tool for turning components comprising an elongated handle, a head provided at one end of said handle, said head being adapted for engagement with a component for the turning of said component, a member engageable with said head and said handle, means for pivotably mounting said member at said handle for movement about a pivot axis lying in a plane extending substantially at right angles to a plane extending lengthwise of said handle and substantially at right angles to said handle, means for pivotably mounting said head at said member for movement about a pivot axis extending substantially perpendicular to said member, said head being pivotably connected to the handle for pivotable movement relative to the handle about an axis lying such that when the head engages the component to be turned the handle can be pivoted relative to the head from a position which is generally radial to a position in which it is more axial with respect to the axis about which the component is to be turned, and means cooperating with said head for automatically opening and closing the effective size of said head engageable with said component as a function of the movement of said handle, said head including a gripping strap in the form of a closed loop to be located about a component to be gripped, said cooperating means including nose formation means pivotable relative to said gripping strap for gripping the component between the gripping strap and the nose formation means of said gripping nose member, said gripping nose member having a forked portion including arms, said gripping strap being generally flat and having shoulders defining a thin portion and a thick portion, said thin portion being pivotably mounted between the arms of said forked portion, said thick portion being of substantially the same thickness as the forked portion of said gripping nose member which is also generally flat.

4,084,457

SCREW REMOVING TOOL

Donald L. Berg, 114 N. Douglas St., Dodgeville, Wis. 53533

Filed Jun. 29, 1977, Ser. No. 810,936
Int. Cl.[2] B25B 7/02
U.S. Cl. 81—425 R 10 Claims

1. A tool for removing embedded screws and the like, comprising:
   a. a pair of connected handles,
   b. a pair of screw removal heads mounted one to each of said handles in opposed relation in position to engage a screw between said heads when said handles are forced toward a closed position, each of said screw removal heads having,
      1. a pair of parallel clinching edges disposed in laterally spaced relation,
      2. a third clinching edge disposed between and perpendicular to said pair of parallel clinching edges and connecting the same to form a generally U-shaped jaw, said perpendicular clinching edge forming the bottom innermost edge of each said screw removal head,
   whereby firm engagement of said screw removal heads with opposite sides of a screw head will force said parallel edges into the sides of the screw head to allow rotational torque to be applied to the screw to allow the same to be turned out by rotation of said handles and will cause said perpendicular edges to engage the screw head to oppose movement of the tool off the screw head.

4,084,458

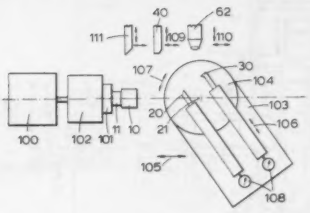
MANUFACTURE OF CONTACT LENSES

Geoffrey Harrison Galley, Radlett, England, assignor to Global Vision (U.K.) Limited, Southampton, United Kingdom

Continuation-in-part of Ser. No. 511,091, Oct. 1, 1974, abandoned. This application Sep. 29, 1975, Ser. No. 610,244
Claims priority, application United Kingdom, Oct. 6, 1973, 46775/73
Int. Cl.[2] B23B 1/00, 5/40
U.S. Cl. 82—1 C 12 Claims

1. In a method of manufacturing a contact lens having a first and second lens surfaces, said method including the steps of:
   a. centering a contact lens blank on the chuck of a lens lathe having at least a radius cutting tool and edge cutting tools means,
   b. machining the centered blank with said radius cutting tool to form the first curved lens surface, and
   c. machining the second opposite curved lens surface, the improvement comprising machining a peripheral edge portion with the edge tool cutting means while the blank is still centered on the chuck, after performing step (b), so as to form a circumferential edge surface adjacent said first curved surface and to separately form a frusto-conical surface adjoining said circumferential edge surface and opposite the peripheral portion of said first curved surface.

11. A machine for manufacturing a contact lens from a contact lens blank said machine comprising:
   i. a lens blank support rotatable about an axis;
   ii. first and second material removing tools mounted on a table on a radius arm, said radius arm being traversable in an arc about an axis and adapted to permit said first tool to



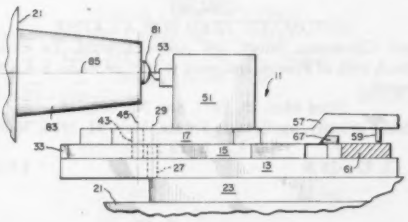
contact said lens blank and machine a curved lens surface thereon, and to permit said second tool to thereafter contact said blank and machine a circumferential edge surface thereon without removing the blank from the support, and
   iii. a third material removing tool adapted to advance transversely of the axis of rotation of the blank support and to form a frusto-conical surface on the blank at its periphery.

4,084,459

METHOD AND APPARATUS FOR LENS TURNING

James A. Clark, Honeoye Falls, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,001
Int. Cl.[2] B23B 5/40, 25/06
U.S. Cl. 82—1 C 11 Claims

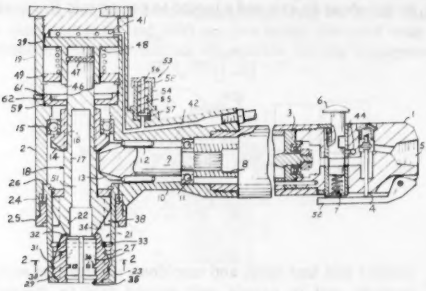


1. Apparatus for forming a surface on a workpiece, said apparatus comprising:
   (a) support means;
   (b) a first member pivotally connected to said support means for rotation about a first axis;
   (c) a second member pivotally connected to said first member for rotation about a second axis, said second axis being offset from and substantially parallel to said first axis; and
   (d) means, responsive to rotation of the second member about said second axis, for rotating said first member about said first axis, said rotation of said first member about said first axis being simultaneous with at least a portion of said rotation of said second member about said second axis whereby said second axis may rotate about said first axis while said second member rotates about said second axis.

4,084,460
HAND HELD NUT RUNNING AND CRIMPING POWER TOOL

Nicholas J. Garofalo, 259-09 81st Ave., Floral Park, N.Y. 11004

Filed Mar. 4, 1977, Ser. No. 774,513
Int. Cl.[2] B25B *23/00*
U.S. Cl. 81—10 8 Claims

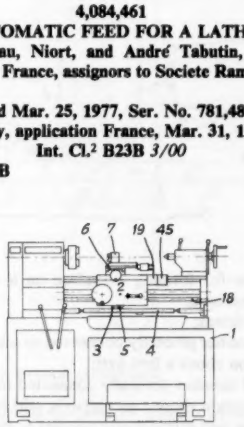


1. A hand held portable tool comprising a housing, a group of levers supported in the housing, the levers having a normal position in hexagonal array defining a hexagonal opening adapted to slidably receive a hexagonal work nut, the levers being adapted for rotation to carry the received nut around with them, the levers also being pivotable from the normal position inwardly of the opening to effect a crimping action upon the side faces of the received nut, a cam member having rotatable and axial movement in the housing, means for transmitting rotation of the cam member to the levers, means for translating the axial movement of the cam member into pivotal movement of the levers, air motor means for transmitting rotation to the cam member, air powered piston means for imparting axial movement to the cam member, and control means selectively operable for causing application of operating air to either the motor means or to the piston means, wherein the cam member has a ball bearing and groove connection with the piston enabling the cam member to have rotation relative to the piston and to have axial movement as a unit with the piston.

4,084,461
AUTOMATIC FEED FOR A LATHE

Marcel Champeau, Niort, and André Tabutin, La Celle-St-Cloud, both of France, assignors to Societe Ramo S.A., Niort, France

Filed Mar. 25, 1977, Ser. No. 781,483
Claims priority, application France, Mar. 31, 1976, 76 09350
Int. Cl.[2] B23B *3/00*
U.S. Cl. 82—21 B 6 Claims

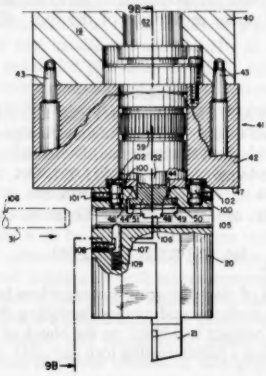


1. A lathe including:
a bed;
means for mounting a workpiece for rotational movement about an axis extending along said bed;
a tool holder carriage mounted for movement along said bed in a direction parallel to said axis;
a tool holder cross-slide mounted for movement relative to said tool holder carriage in a direction extending transversely of said bed;
a tool holder supported by said tool holder cross-slide;
means for driving said tool holder with respect to said bed;
first drive propulsion means operable to drive said tool holder driving means at a slow speed of movement, said first drive propulsion means including a guide bar extending along said bed for guiding said tool holder carriage, a first gear train engageable with said guide bar and carried by said tool holder carriage, first clutch means operable to connect said first gear train to said tool holder driving means, and a first solenoid actuatable to engage said first clutch means;
second drive propulsion means operable to drive said tool holder driving means for rapid movement of said tool holder, said rapid drive propulsion means including a drive motor carried by said tool holder carriage, a second gear train carried by said tool holder carriage and operably connected to be driven by said motor, second clutch means engageable to connect said second drive propulsion means with said tool holder driving means, and a second solenoid actuable to engage said second clutch means;
first control means for selecting slow driving movement of said tool holder driving means;
a first electric circuit connecting said first solenoid to said first control means;
a first switch means in said first electric circuit effective to interrupt energization of said first solenoid;
second control means for selecting rapid driving movement of said tool holder;
second switch means for interrupting energisation of said second solenoid;
and a second electric circuit connecting said second solenoid to said second switch means.

4,084,462
CLAMPING MEANS FOR A TOOL BLOCK IN A VERTICAL BORING MACHINE OR THE LIKE

Claude M. Grinage, Stratford, Conn., assignor to The Bullard Company, Bridgeport, Conn.

Continuation-in-part of Ser. No. 506,584, Sep. 16, 1974. This application Sep. 2, 1975, Ser. No. 609,429
Int. Cl.[2] B23B *29/00, 29/14;* B23Q *3/155*
U.S. Cl. 82—36 R 7 Claims



1. A changeable tool block and clamping means for a machine tool having automatic clamping tool means, which comprises
a. tool block body mounting a cutting tool,
b. said body being provided with a guide slot in its upper portion extending from one side to the other and having overlying flanges partially restricting the upper opening of the slot,

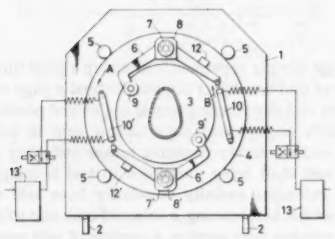
c. clamping means including a clamping element of generally inverted "T"-shaped cross-section,
d. said guide slot being adapted for the latter slideable reception of said clamping element, and accommodating the entry of said clamping element at one side and its exit at the other side,
e. said overlying flanges having upwardly diverging alignment surfaces spaced from said clamping means upon the initial reception of said clamping element in said guide slot and operative when said tool block is tightly clamped to mate with said clamping means whereby the tool block is oriented and positioned in said clamping means,
f. said tool block having a plurality of upwardly extending locating lugs, and
g. said clamping means having locating recess means for the reception of said lugs for effecting lateral alignment of the tool block.

4,084,463

APPARATUS FOR CUTTING AND CHAMFERING IRREGULAR SHAPED PIPES

Takahiro Kanbara, Kusatsu, and Toshihiko Mituhara, Moriyama, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1977, Ser. No. 759,523
Int. Cl.[2] B23B *37/00, 3/28*
U.S. Cl. 82—53.1 **7 Claims**



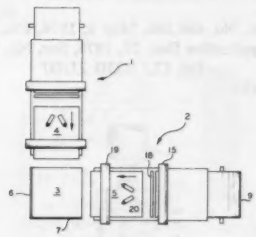
1. An apparatus for cutting circular and non-circular pipes, comprising:
a. a rotatable drum through which the pipe to be cut extends,
b. a first lever pivotally mounted on an end face of said drum,
c. a first fluid pressure cylinder pivotally mounted on said end face,
d. a first piston rod extending out of said cylinder and connected to one end of said lever,
e. a first cutting member rotatably mounted on said lever and extending toward the pipe,
f. first dirve means for rotating said cutting member
g. a first guide roller rotatably mounted on said lever adjacent said cutting member and axially aligned therewith, whereby said lever, cutting member, and guide roller may be pivoted toward the pipe by the actuation of said fluid pressure cylinder, whereby said cutting member cuts into the pipe to a depth determined by the guide roller, the latter engaging and following the surface of the pipe as the drum rotates thereabout, and
h. a first accumulator means coupled to said cylinder for maintaining the pressing force of said guide roller against the periphery of said pipe as said guide roller follows the periphery of said pipe.

4,084,464

APPARATUS FOR PREPARING CROSS-LAPPED FILM STRUCTURES

John R. Bowers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 27, 1970, Ser. No. 58,245
Int. Cl. B65h *39/06, 29/28*
U.S. Cl. 83—94 **8 Claims**



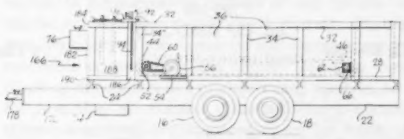
1. An apparatus for crosslapping film comprising a first delivery means and a second delivery means, wherein said first delivery means and said second delivery means are adjacent and at an angle to each other and cooperate one with the other such that cut lengths of said film are delivered to a common location from said first delivery means and said second delivery means in alternating order, said first and said second delivery means each comprising, in combination, means for introducing a continuous sheet of said film into a first transporting means, said first transporting means comprising at least a first pair of powered counter-rotating rollers for passing said film therebetween to a cutting means, a cutting means for severing said film into said cut lengths, a second transporting means comprising at least a second pair of powered counter-rotating rollers for passing said cut lengths of film therebetween from said cutting means to said common location, and means for directing a moving stream of gas positioned between said cutting means and said second transporting means wherein said moving stream of gas is directed toward the nip of said second pair of rollers.

4,084,465

SUGAR CANE PLANTER

Clet Dugas, Box 535, Loreauville, La. 70552

Filed Jul. 2, 1976, Ser. No. 702,028
Int. Cl.[2] B23D *53/00*
U.S. Cl. 83—103 **23 Claims**



1. A suger cane planter, which comprises:
means for receiving a plurality of sugar cane stalks to be cut comprising a wheeled vehicle having substantially parallel side walls defining a stalk receiving area therebetween;
means mounted on said receiving means and positioned on a cutting assembly located adjacent one end of said vehicle for cutting said plurality of stalks of sugar cane;
means operatively connected to said cutting means for moving same across said receiving means transversely through said plurality of sugar cane stalks located therein; and
wherein said vehicle includes hopper means positioned below said cutting assembly for delivering the cut sugar cane to the ground therebelow which comprises a pair of guide plates respectively attached to said parallel side walls and extending downwardly therefrom towards one

another at an inclination so as to form a cane receiving aperture therebetween.

4,084,466

APPARATUS FOR SEVERING THIN-WALLED TUBING ON A MANDREL

Frank Sipusic, Brookfield, and Arthur L. Sheridan, Woodridge, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 468,106, May 8, 1974, Pat. No. 3,942,221. This application Dec. 29, 1975, Ser. No. 645,037

Int. Cl.² B23D *21/00*

U.S. Cl. 83—193 **11 Claims**

1. Severing apparatus for flexible, thin-walled tubing material sheathed about a support mandrel comprising at least two severing blades disposed in a substantially uniform circular planar arrangement about a mandrel and adapted to be reciprocated to and from the surface of said mandrel, each of said severing blades being pivotally mounted about an axis parallel to said mandrel on a blade mount and having two spaced apart, angularly spaced tubing engaging edges, the bisector of the angle subtended by said engaging edges on said blade defining a pivot point with an axis parallel to said mandrel for mounting said severing blade on said mount and means for reciprocating said blade mount with said severing blade mounted thereon.

4,084,467

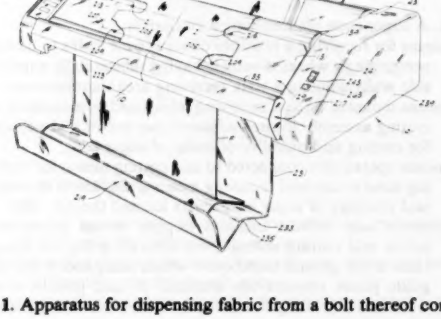
APPARATUS FOR DISPENSING FABRIC FROM A BOLT

Gail B. Schwarz, Belleville, Ill., assignor to The Measuregraph Company, St. Louis, Mo.

Division of Ser. No. 560,358, Mar. 20, 1975, Pat. No. 4,004,148, which is a continuation-in-part of Ser. No. 477,166, Jun. 6, 1974, Pat. No. 3,902,500. This application Nov. 8, 1976, Ser. No. 739,959

Int. Cl.² B26D *5/00*

U.S. Cl. 83—208 **8 Claims**



1. Apparatus for dispensing fabric from a bolt thereof comprising a panel over which the fabric is fed, said panel having means for guiding a cutting instrumentality for cutting the fabric on a line extending transversely across the fabric, means for unwinding fabric from the bolt and feeding it over the panel, means for measuring the length of fabric unwould from the bolt, means for presetting the length of fabric to be dispensed, means for starting the unwinding means, means for starting operation of the measuring means in response to arrival of the leading edge of the fabric generally at said line, means for comparing the length measured by the measuring means with the preset length, and means controlled by the comparing means for stopping the unwinding means when the preset length has been fed past said line.

4,084,468

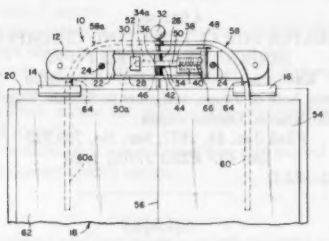
ELECTRIC PAGE TURNER

Frank M. Butler, 10 Weber Ter., S. Amboy, N.J. 08879

Filed Jul. 19, 1976, Ser. No. 706,139

Int. Cl.² G10G *7/00*

U.S. Cl. 84—500 **5 Claims**



1. A page turning apparatus comprising a page turning arm, a portion of said arm being disposed behind a page of an open book when said page turning arm is in a locked position, means to releasably engage said page turning arm in said locked position, said releasably engaging means including a shaft, a housing, said shaft being journalled to said housing, an arm, said arm extending radially outwardly from said shaft and disposed within said housing, a solenoid coil, said solenoid coil having a moving core portion, a portion of said moving core portion disposed outwardly from said solenoid coil and in touching engagement with the free end of said arm when said page turning arm is in said locked position, bias means to urge said page turning arm from said locked position into a released position, said portion of said page turning arm causing said page to be turned when said page turning arm traverses from said locked position to said released position, means to manually engage said page turning arm from said released position into said locked position.

4,084,469

WEB CUTTING DEVICE

Herbert Ray Gray, 26 Russell St., Littleton, Mass. 01460

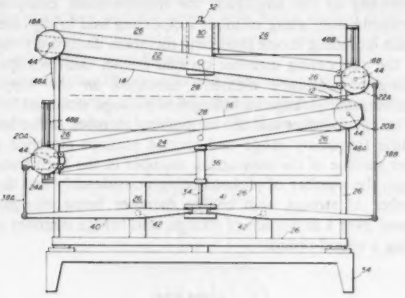
Filed Dec. 17, 1976, Ser. No. 751,387

Int. Cl.² B26F *3/00*

U.S. Cl. 83—542 **12 Claims**

1. Cutting apparatus comprising first and second wire segments that contact each other at substantially a single point and that are segments of a single continuous loop of wire, means for maintaining each wire segment taut comprising first and second spaced apart beams, each supported for limited rotational motion about a pivot point and each including spaced apart

bearing members about which said single wire is trained, and means for moving at least one of said segments relative to the



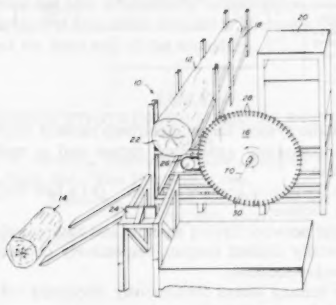
other to cause the point of contact to move along each of the segments.

4,084,470

CARBIDE TIPPED INSERTABLE SAW TOOTH

Jack K. Reed, c/o Reed's Carbide Service 1210 12th St., Lynchburg, Va. 24504

Filed May 10, 1976, Ser. No. 685,100
Int. Cl.² B27B 5/29
U.S. Cl. 83—841 **2 Claims**



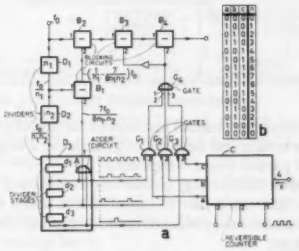
1. A slasher for use in paper pulp manufacture comprising a flat steel disc rotatable about an axis perpendicular to the center of the disc, the disc having a plurality of radially extending slots in the periphery thereof for receiving insertable teeth and a plurality of insertable teeth fixed in the slots, each tooth comprising a flat elongated plate of steel of even thickness having a rounded base, substantially parallel leading and following edges with a V-shaped groove extending along a lower major portion of the leading and following edges engaging the edges of the slots, a planar top angularly extending from an inner point on the following edge of the tooth toward an outer point near the leading edge of the tooth, the inner and outer points being radially outside of the outer edge of the disc, a notch at the outer point receiving a blade of material having a hardness of at least 9 MOHS in the form of a cubic trapezoid the base of which is arranged from 0.00 to 0.15 inches ahead of said leading edge, parallel to a radial line extending from the center of the disc, and perpendicular to the plane of the disc, the width of the base being between 1.2 and 1.8 times the thickness of said plate, the sides of the blade being relieved from the base at an angle of between 2° and 20°, the upper surface of the blade being arranged essentially coplanarly with but radially outward from said planar top, the blade being retained in said notch by brazing the blade to the plate.

4,084,471

CIRCUIT ARRANGEMENT FOR OBTAINING A CHORUS EFFECT

Nico Valentinus Franssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,131
Claims priority, application Netherlands, Apr. 9, 1975, 7504203
Int. Cl.² G10H 1/00
U.S. Cl. 84—1.01 **4 Claims**



4. A circuit arrangement for generating the tones of a tonal scale, comprising:

means for supplying a signal of a predetermined frequency;

a first divider having an input connected to said means for supplying a signal, and an output at which a signal of a frequency equal to the desired frequency shift is produced,

a second divider with an adjustable dividend, having an input connected to the output of said first divider, and an output;

a first blocking circuit having a first input connected to the output of said first divider, a second input to which a blocking signal may be applied, and an output;

a third divider comprising a plurality of divider stages having an input connected to the output of said second divider, and a plurality of outputs on which non-coincidental pulse trains are generated, and adder means having inputs connected to corresponding outputs of said divider stages and an output on which a signal having the sum frequency of the signals on said inputs is generated, said output being connected to said second input of said first blocking circuit;

a multiple gate circuit having a plurality of first inputs connected to corresponding outputs of said divider stages, second inputs, and an output on which a signal having the sum frequency of the signals on said inputs is generated;

a reversible counter having a control input, an input for blocking the counter in a predetermined position, an input for reversing the counter direction, and a plurality of outputs connected to corresponding second inputs of said multiple gate circuit, the frequency of the counting cycles of the counter being equal to a predetermined vibrato frequency;

a second blocking circuit having a first input connected to said means for supplying a signal, a second input connected to said output of said first blocking circuit, and an output;

a third blocking circuit having a first input connected to said output of said second blocking circuit, a second input connected to said output of said multiple gate circuit, and an output; and

a fourth blocking circuit having a first input connected to said output of said third blocking circuit, a second input connected to said output of said multiple gate circuit, and an output for producing the desired output signal.

4,084,472
ELECTRONIC MUSICAL INSTRUMENT WITH TONE GENERATION BY RECURSIVE CALCULATION

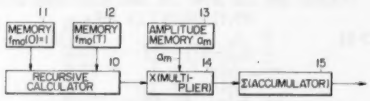
Koji Niimi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 13, 1977, Ser. No. 758,913

Claims priority, application Japan, Jan. 14, 1976, 51-3322; Jan. 14, 1976, 51-3323; Jan. 14, 1976, 51-3324

Int. Cl.[2] G10H *1/02*; G10F *1/00*

U.S. Cl. 84—1.01 **8 Claims**



1. An electronic musical instrument having digital recursive calculation means and capable of generating a superposition of a group of partial tones comprising:

a recursive calculating circuit for calculating partial tone functions from a pair of initial values and a pair of recursion parameters predetermined for each of the partial tone functions;

initial value memory means for supplying said pairs of initial values for the respective partial tone functions to said recursive calculating circuit, at least each one of said pairs of initial values being a common constant for all the partial tone functions; and

amplitude memory means for storing each one constant for the respective partial tone functions for compensating for the amplitude of the outputs of said regression operation circuit.

4,084,473
ELECTRIC PIANO

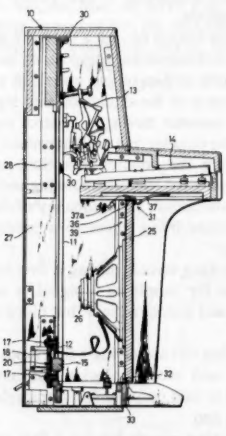
Riichi Kitashima, Iwata; Masakazu Matsumoto, and Shinji Tagaki, both of Hamamatsu, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Aug. 13, 1976, Ser. No. 714,267

Claims priority, application Japan, Aug. 19, 1975, 50-114226[U]; Nov. 1, 1975, 50-149508[U]; Nov. 1, 1975, 50-149509[U]; Nov. 10, 1975, 50-152804[U]; Nov. 19, 1975, 50-157082[U]; Dec. 17, 1975, 50-170910[U]; Dec. 22, 1975, 50-174124[U]

Int. Cl.[2] G10C *3/04*

U.S. Cl. 84—1.14 **12 Claims**



1. In an electric piano having a casing with a frame, a plurality of strings stretched on the frame, a bridge member supporting the strings at intermediate portions thereof, a plurality of hammers for striking the strings, a plurality of keys for actuating the hammers, electrical pickups for detecting vibrations of the strings, an amplifier connected to the pickups and a speaker connected to the amplifier, the improvement comprising a vibratable supporting member supporting said bridge member, means including shock absorbing members dampingly supporting the supporting member on said frame, said pickups comprising piezoelectric elements mounted on the supporting member, said pickups including first pickups mounted between the bridge member and the supporting member in the low and middle frequency range and second pickups attached to the outer surface of the supporting member in the high frequency range, the number of pickups being considerably less than the number of strings, said bridge member being elongated to extend over a multitude of strings, said bridge member constituting a sound-board.

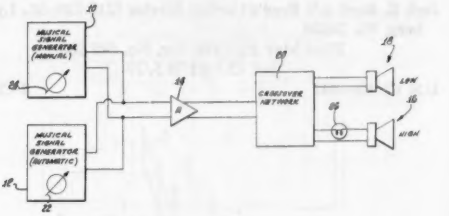
4,084,474
SELECTIVE HIGH FREQUENCY COMPRESSION DEVICE FOR SPEAKER SYSTEM

Donald James Leslie, 1561 Gaywood Dr., Altadena, Calif. 91001

Filed Feb. 4, 1976, Ser. No. 655,106

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.27 **3 Claims**



1. In an audio system for an electronic musical instrument including a composite generating means and a multiband speaker system:

(a) a high frequency speaker section; (b) a low frequency speaker section;

(c) a divider network having an input and having a plurality of spectrally distinct outputs respectively connected to said speaker sections;

(d) power sensing means continuously associated only with said high frequency section and operative to compress the high frequency response as a gradual function of increased power level;

(e) said high frequency speaker section being operative at all power levels to translate electrical impulses into sound.

4,084,475
GUITAR CONSTRUCTION

William M. Horowitz, 2849 W. Jerome St., Chicago, Ill. 60645

Filed Sep. 16, 1976, Ser. No. 723,750

Int. Cl.[2] G10D *3/00*

U.S. Cl. 84—291 **3 Claims**

1. A stringed instrument of the guitar variety having

A. a soundbox of wood with a head end and a foot end and formed of soundboard, back and sidewalls,

B. a neck,

C. a head,

D. a sound hole provided in the soundboard,

E. a transverse bridge firmly secured to the surface of the soundboard between the sound hole and the foot end of the soundbox,

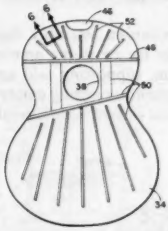
F. a plurality of strings stretched from the head to the soundbox, the soundbox ends of the strings being anchored only to the bridge,

G. a fingerboard extending from the head along the neck and over the soundboard to the sound hole,

H. the neck being secured to the soundbox at the head end opposite the foot end,

I. that portion of the fingerboard between the head end of the soundbox and the sound hole being spaced from the soundboard to provide a substantial cantilevered length overlying the soundboard,

J. means bracing the soundboard and secured to its undersurface comprising a series of relatively thin struts extending from the general location of the hole and fanning out-



wardly away from the soundhole toward the foot end of the soundbox, and other struts generally framing the sound hole and

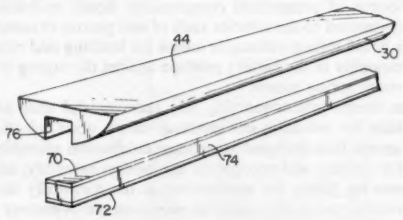
K. means bracing the portion of the soundboard beneath the overlying cantilevered length secured to the undersurface of the soundboard and comprising a series of thin struts extending from the vicinity of the sound hole and fanned about the hole substantially to encompass the majority of the central area of the soundboard between the sound hole and the head end of the soundbox.

4,084,476

REINFORCED STRINGED MUSICAL INSTRUMENT NECK

James H. Rickard, Harwinton, Conn., assignor to Ovation Instruments, Inc., New Hartford, Conn.

Filed Jun. 25, 1976, Ser. No. 699,869
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—293 **19 Claims**



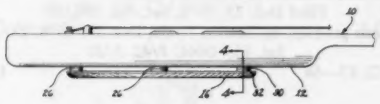
1. In a stringed musical instrument the combination comprising: a neck having an elongated body with a generally flat forward surface extending longitudinally thereof and a transversely curved rear surface also extending longitudinally thereof, a fingerboard attached to said neck body and overlying said generally flat forward surface thereof, and an elongated reinforcing member extending longitudinally of said neck body and fixed relative thereto, said reinforcing member being made of a composite material consisting of filaments of a material having a modulus of elasticity of over 28×10^6 psi embedded in a resin matrix, and said reinforcing member being spaced in the direction perpendicular to said forward surface from the neutral bending axis of said neck body and fingerboard in combination with regard to bending of said neck body in a plane parallel to the longitudinal axis of said neck body and perpendicular to said forward surface.

4,084,477

PROTECTIVE PAD FOR MUSICAL INSTRUMENTS

Richard Lee Dominguez, 3835 W. Eva Ave., Phoenix, Ariz. 85021

Filed Oct. 20, 1976, Ser. No. 734,341
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—327 **4 Claims**



1. An article for protecting a surface finish of musical instruments such as guitars and basses comprising:

(a) a pad releasably secured to said surface in a position spaced from said surface, said pad comprising:

(i) a self-supporting backing layer,

(ii) a matt adherably bonded to and substantially covering a first major surface of said backing layer, said matt comprising a mass of soft, pliant fibers extending from said backing layer,

(iii) a smooth, substantially non-abrasive layer bonded to and substantially covering a second major surface of said backing, said second major surface opposing said first major surface of said backing layer, and

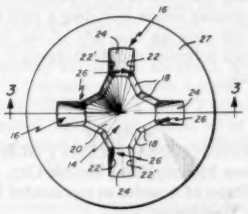
(b) a plurality of spaced pedestal members located on said non-abrasive layer, said pedestal members comprising a first section bonded to said non-abrasive layer and a second section adapted to be bonded to said surface to be protected, said first section comprising first mating means and said second section comprising second mating means, said mating means being mutually releasably couplable whereby said pad including said first section of said pedestal members can be releasably detached from said second section when said second section is bonded to the surface to be protected.

4,084,478

SCREW HEADS

Frederick A. Simmons, Framingham, Mass., assignor to Phillips Screw Company, Natick, Mass.

Filed Sep. 12, 1974, Ser. No. 505,324
Int. Cl.[2] F16B *23/00*
U.S. Cl. 85—45 **33 Claims**



1. In a screw having driver-engageable surfaces at one end thereof for mating with a driver to enable said mated driver to rotatably drive said screw, said driver having surfaces and edges, the improvement comprising a projection formed on at least one of said driver-engageable surfaces and at a location which is displaced radially from the longitudinal axis of the screw and at which the projection is capable of being engaged by an edge formed on the driver, said projection extending from said driver engageable surface and being of sufficiently small dimensions as to be deformable to enable said edge on said driver to dig into and deform said projection in response to application of driving torque by said mated driver, said projection being oriented to cooperate with said edge of said driver

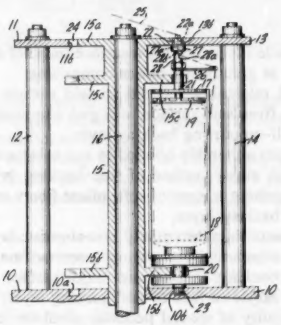
to retard withdrawal of the driver from the screw during application of driving torque.

4,084,479

BRAIDING MACHINE

Eliseo Ratera, Polgono Industrial "ELS DOLORS" s/n. P.O. Box 228, Manresa (Barcelona), Spain

Filed Dec. 13, 1976, Ser. No. 750,195
Claims priority, application Spain, Dec. 23, 1975, 217.673
Int. Cl.[2] D04C *3/42, 3/20*
U.S. Cl. 87—48 **1 Claim**



1. A braiding machine comprising a carrier for a bobbin, a pair of spaced apart tracks for guiding the carrier along a closed sinuous path, said pair of spaced apart tracks including a base plate for supporting the carrier and having a recessed sinuous track formed in the upper surface thereof and an upper star shaped plate surrounded by an outer ring plate both supported above the base plate, drive means for imparting movement to the carrier along said sinuous path, a track follower at the lower end of the carrier and riding within said recessed sinuous track in the base plate, a plurality of circular discs carried by said driving means intermediate the star shaped and outer ring plates, a recess formed in the outer periphery of each of said discs and moving relative to the outer edge of the star shaped plate and the inner edge of the outer ring plate, a track follower for said carrier interposed within said recess in the disc, so that as the driving means advances the carrier the track follower is guided along an outer edge of the star shaped plate or an inner edge of the outer ring plate within said recess, and means for guiding the yarn as it is unwound from a bobbin of a carrier, said guiding means including a yarn guiding passage for receiving the yarn on one side of the track, guiding it through the track follower and discharging it on the opposite side of the track.

4,084,480

LIGHTWEIGHT SMALL CRAFT GUN SYSTEM

William Matthew Moscrip, King George City, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 20, 1975, Ser. No. 606,906
Int. Cl.[2] F41F *19/14*
U.S. Cl. 89—42 B **5 Claims**

1. A light-weight, rapid-fire gun utilizing fire-out-of-battery and straight through ammunition feed principles for firing expendable breechcase ammunition comprising:

a frame:

a slide assembly trunion mounted on said frame, said slide assembly being provided with a pair of opposed feed and ejection slots;

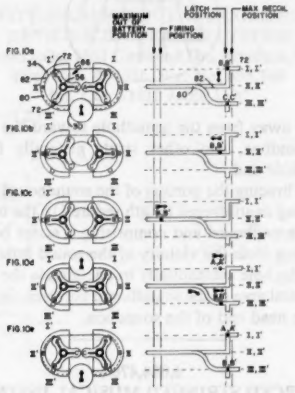
a receiver assembly disposed within said slide assembly for reciprocating movement along the firing axis between an ammunition feed and breechcase ejection battery position and a forward firing out-of-battery position, said receiver assembly being provided with a central feed and ejection slot;

a pair of internal fixed hollow shafts disposed within said receiver assembly on axes parallel to and on each side of the firing axis, the forward ends of said shafts being closed;

a barrel fixed to the forward end of said receiver assembly and reciprocable therewith;

an indexing clip feed mechanism fixed to said slide assembly adjacent said feed slot for feeding expendable breechcase ammunition into said receiver assembly through said feed slot;

a breechcase mechanism assembly disposed within said receiver assembly for receiving ammunition from said clip feed mechanism, supporting said ammunition during firing, and subsequently ejecting empty breechcases through said ejection slot in said slide assembly;



recoil spring means on said slide assembly normally urging said receiver assembly forward toward the out-of-battery position, said recoil spring means comprising:

a pair of hollow pistons fixed to the rearward end of said slide assembly and disposed within with hollow shafts, and

a source of pressurized compressible liquid hydraulically connected to the exterior ends of said pistons to constitute a liquid spring; releasable means for latching said receiver assambly in the battery position against the urging of said recoil spring means;

cam means interconnecting said receiver and slide assemblies for releasing said latching means upon injection of ammunition into said breechcase mechanism assembly and for cycling said breechcase mechanism assembly; and

means for firing the ammunition as the forwardly moving receiver assembly nears the maximum out-of-battery position.

4,084,481

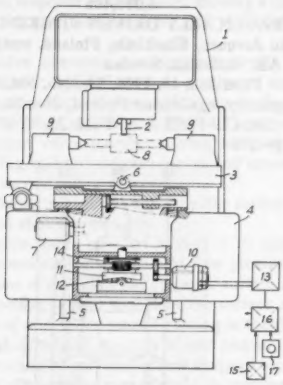
PROCESS FOR MACHINING GEARS AND MACHINE FOR PERFORMING THE SAME

Oscar G. Bossi, Milan, Italy, assignor to Societe Diete: Stabilimento Industriale Construzione Macchinario Attrezzature, Pianezza, Italy

Filed Jun. 3, 1976, Ser. No. 692,315
Claims priority, application France, Jun. 13, 1975, 75 18633
Int. Cl.[2] B26F *19/06, 21/28*
U.S. Cl. 90—1.6 R **5 Claims**

1. A continuous process for machining gears to final predetermined dimensions in a shaving machine including means for supporting a shaving tool and means for supporting the gear to be shaved by performing a continuous shaving process comprising the steps of performing a first step of moving at least

one of said supporting members towards the other in a single continuous movement to a predetermined position at which the spacing therebetween theoretically corresponds to that required to obtain the desired final predetermined dimension of the gear by shaving with said tool; immediately thereafter performing a withdrawal step of moving said at least one



supporting member slightly away from the other supporting member to relieve stresses in the shaving machine and gear built up during said first step; and immediately thereafter performing a finishing step of moving said at least one supporting member towards the other supporting member to said predetermined position.

4,084,482

MACHINE TOOLS HAVING A ROTATING SPINDLE SUCH AS MILLING MACHINES

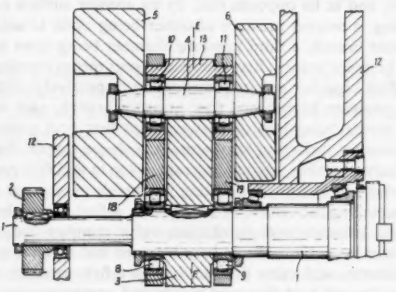
Robert F. Derrien, Montgeron, France, assignor to Societe Hure S A, Bagneux, France

Filed Mar. 16, 1976, Ser. No. 667,364

Claims priority, application France, Mar. 21, 1975, 75 08869; Jul. 9, 1975, 75 21517

Int. Cl.[2] B23C *9/00*; B23Q *5/22*

U.S. Cl. 90—11 R **10 Claims**



1. A machine tool comprising:

a rotatable spindle having means for receiving a tool therein, flywheel means,

first roller means carried by said spindle,

further roller means adapted for rolling engagement with said first roller means to be rotated thereby, said flywheel means coupled to said further roller means to be rotated as said further roller means is rotated,

and selectively operable means for engaging and disengaging the first roller means from said further roller means to thereby selectively provide and remove power from said flywheel means.

4,084,483

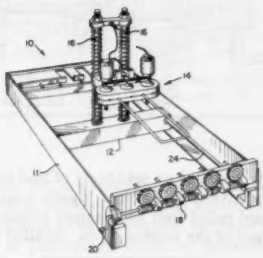
PANTOGRAPH APPARATUS

James B. Walker, 3151 W. Argyle, Chicago, Ill. 60625

Filed Jan. 27, 1977, Ser. No. 765,926

Int. Cl.[2] B23C *1/18*

U.S. Cl. 90—13.3 **6 Claims**



1. A pantograph apparatus for making duplicates from a master comprising a frame having horizontally disposed guide means, a copying means for engraving said duplicates secured by support means for reciprocal linear travel on said guide means, and adapted to engrave at least one duplicate according to an original work, wherein the improvement lies in said copying means being positioned at a desired height by resilient compression means positioned on said support means, said resilient compression means being formed by selected interchangeable and complementary sets of resilient compression members, each set being formed of an upper and lower member, each set positioning said copying means at different selected heights to accommodate original works having cross sections of different sizes, said lower members supporting the copying assembly and said upper members biasing the copying assembly against lower members thereby securing said copying means in a vibration free manner and allowing said copying means to accurately reproduce said master.

4,084,484

DEVICE FOR REMOVING INTERNAL CIRCULAR FLASH

Leonid Pavlovich Shklyanov, ulitsa Zhulyabina, 8, kv. 14; Vladimir Nikitich Baranov, prospekt Lenina, 30/13, kv. 16; Dmitry Nikiforovich Koltyrev, prospekt Juzhny, 22, korpus 3, kv. 78, all of Elektrostal Moskovskoi oblasti; Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Ivan Ivanovich Polyansky, prospekt Lenina, 30/13, kv. 13, and Tamila Iosifovna Osinskaya, ulitsa Zhulyabina, 3, kv. 91, both of Elektrostal Moskovskoi oblasti, all of U.S.S.R.

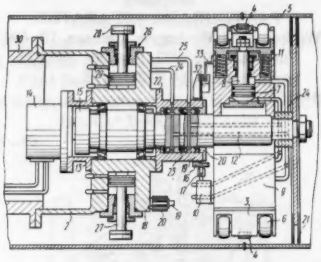
Filed Jun. 24, 1976, Ser. No. 699,634

Int. Cl.[2] B23D *1/24*

U.S. Cl. 90—24 C **3 Claims**

1. A device for removing internal circular flash during resistance butt-welding of pipes comprising: a tool head; an appliance for bringing said tool head to the flash removing zone; a rod, one end of which is cantilevered on said appliance for bringing said tool head to the flash-removing zone while its other end is connected to said tool head; said tool head comprises: a body; a holder with a cutting tool secured in it; a master form with a profiled surface, rigidly secured on said body of said tool head; a slide valve; a rod of said slide valve interacting with the profiled surface of said master form; a mechanism for radial feed of said holder carrying said slide valve; a housing on said radial feed mechanism; a rotary drive of said radial feed mechanism; said radial feed mechanism is made in the form of a hydraulic cylinder; a rod of said hydraulic cylinder, rigidly connected with said holder; springs ensur-

ing the cutting force of said cutting tool; said springs bear at one end against said housing of the radial feed mechanism while their other ends bear against said holder; a rotary drive



of said holder, installed on said body of said tool head; a shaft of said rotary drive of said holder, rigidly connected with said housing of said radial feed mechanism; rollers for tracing the internal surface of the welded pipes, installed on said holder.

4,084,485

DRIVING MECHANISMS AND HOUSINGS FOR SUCH MECHANISMS

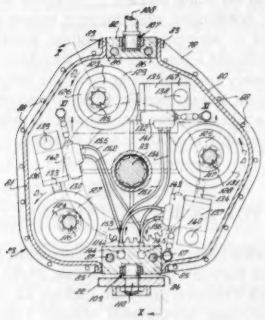
Cornelis van der Lely, Zug, Switzerland, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Jun. 19, 1975, Ser. No. 588,140

Claims priority, application Netherlands, Jun. 25, 1974, 7408501

Int. Cl.[2] F01B *15/04*

U.S. Cl. 91—210 **27 Claims**



1. A driving mechanism which comprises:
- a source of hydraulic fluid under pressure substantially greater than the ambient pressure;
- a rotary power output shaft;
- a plurality of hydraulic piston and cylinder assemblies, each of said assemblies in communication with said source of hydraulic fluid under pressure;
- a non-revolving housing, means mounting said assemblies on said housing whereby each said assembly is rockable relative to said housing;
- a plurality of pinions mounted in said housing, at least one corresponding pinion being rotated by reciprocation of each said piston in its respective cylinder and each said assembly caused to rock in an arc from its mounting on said housing by such reciprocating action rotating said pinion;
- a corresponding control valve means for each said assembly for governing the admission of hydraulic fluid communicated thereto from said hydraulic fluid source, each said control valve means connected in part to said housing and in part to its respective assembly whereby it is actuated by the rocking thereof relative to said housing and causes the reciprocation of its corresponding piston; and
- a central pinion connected to said shaft, said central pinion in mesh with each of the aforementioned pinions of said plurality of pinions.

4,084,486

HYDRAULICALLY DRIVEN STRIKING DEVICE

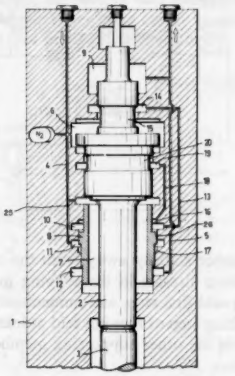
Väinö Esko Juvonen, Klaukkala, Finland, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Jun. 15, 1976, Ser. No. 696,412

Claims priority, application Finland, Jun. 26, 1975, 751895

Int. Cl.[2] F01B *7/18*; F01L *25/06, 17/00*

U.S. Cl. 91—276 **3 Claims**



1. In a hydraulically operated percussion apparatus comprising a housing having a bore in which an impact piston is reciprocatingly movable between a retracted end position and an impact end position in contact with an impact tool for transferring impact energy to said impact tool, pressure chambers defined between said housing and said piston and a channel system including a high pressure and a low pressure branch for conducting hydraulic pressure fluid to and from said pressure chambers, a first one of said pressure chambers surrounding said piston and being defined, at the end of said chamber remote from said impact tool, by an annular shoulder on said piston, and at its opposite end, by an annular surface of said housing, a second pressure chamber being open to said low pressure branch, a third pressure chamber being open to said high pressure branch, first and second port means opening into said first chamber and communicating respectively with said high pressure branch and low pressure branch, said second port means being located between said first port means and said annular surface of said housing, a sleeve shaped distribution valve member surrounding said piston in said first pressure chamber and being reciprocatingly movable in response to the reciprocating movement of said piston, a first valve chamber defined between said distribution valve member and a first recess in the surface of said bore between said first and second port means, said valve member having a first shoulder means facing toward said first port means and communicating with said first valve chamber, said valve member being movable between
- (a) a first end position in which said first port means is covered and said second port means is uncovered,
- (b) an intermediate position in which both port means are covered, and in which, during operation of said apparatus, said valve member and said piston are in contact in said impact position of the latter, and,
- (c) a second end position, out of contact with said piston, in which said first port means is uncovered and said second port means is covered,

the improvement comprising:

first valve means connecting said first valve chamber to said high pressure branch through said second pressure chamber in response to said piston moving a selected distance from said retracted end position,

second valve means connecting said first valve chamber to said low pressure branch through said third pressure chamber in response to said piston moving a distance less than said selected distance from said retracted end position,

a second valve chamber communicating with said high pressure branch and defined by a portion of said distribution valve member and a second recess in the surface of said bore between said first and second port means,

said distribution valve member having a second shoulder means facing said second port means and communicating with said second valve chamber,

said first shoulder means having a greater surface area than said second shoulder means,

said distribution valve member having at its opposite ends pressure actuated surfaces in said first pressure chamber which at one of said ends has a greater surface area facing in the direction of said tool than the surface area of the other end of said valve member facing in the direction of the said retracted end position of said piston,

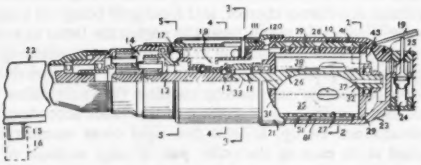
the pressure actuated surfaces of said first and second shoulder means of said valve member and the pressure actuated surfaces of said piston being dimensioned such that said piston hits said valve member shortly before said piston impacts against said tool.

4,084,487

PULSE MOTOR IN A NUT RUNNER

William K. Wallace, Barneveld, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Division of Ser. No. 636,911, Dec. 2, 1975, Pat. No. 4,019,589.
This application Nov. 29, 1976, Ser. No. 745,870
Int. Cl.[2] F01C *9/00*; F01L *21/02*
U.S. Cl. 91—325 **4 Claims**



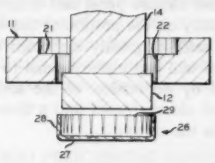
1. In a pneumatically powered nut running tool, a pulse torque transmitting air motor comprising a liner defining a rotor chamber, a rotor supported in the chamber for relative angular movement, a single blade co-extensive with the rotor projecting radially from the latter into bearing relation with a cylindrical wall of the chamber, and means for causing live air to be alternately admitted and vented from areas of the chamber at opposite faces of the blade so as to cause the rotor to oscillate forwardly and reversely about its axis said means including a live air inlet passage, wherein a channel extending longitudinally of the cylindrical wall communicates with the inlet passage, a row of exhaust ports through the cylindrical wall is disposed in parallel opposed relation to the axes of the channel and the rotor, the channel having common communication with the areas of the chamber at opposite faces of the blade, the channel having a first longitudinal side adjacent a first one of said areas of the chamber and on opposed second longitudinal side adjacent a second one of said areas, and valve means resting upon the rotor and loosely disposed in the channel is adapted to be pneumatically shifted from one of said sides of the channel to the other so as to seal the channel off from that one of said areas adjacent to the side to which the valve means has been shifted.

4,084,488

METHOD AND APPARATUS FOR FORMING PLEATED CLOSURE CONSTRUCTION

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 10, 1975, Ser. No. 630,577
Int. Cl.[2] B31F *1/00*
U.S. Cl. 93—36 B **25 Claims**



19. A method for converting a substantially flat closure blank into a closure member having an annular closure flange folded to extend from a central portion, the inner surface of the flange having at preselected locations inwardly protruding pleats formed therein extending generally perpendicular to the perimeter of the flange, the outer surface of the flange being substantially smooth and continuous with substantially the only irregularities in the otherwise smooth outer surface of the flange being hairlines each of which coincides with the location of a respective one of said pleats on the inner surface of said flange, the outer surface of said flange providing said closure member with improved capability for mating with and sealing to a corresponding sidewall member, said method comprising simultaneously:

reforming a peripheral portion of a substantially flat closure blank to form an annular flange extending from a central portion of said blank;

maintaining the outer surface of said annular flange in contact with an annular surface having the size and at least substantially smooth surface characteristics of the desired closure flange; and

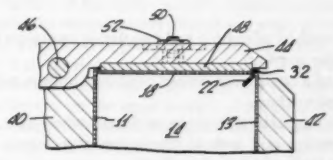
shaping inwardly protruding pleats extending generally perpendicular to the perimeter of said flange at preselected locations along the inside of said annular flange.

4,084,489

METHOD OF FORMING CARTON

Mitchel J. Matovich, Jr., 19100 Bainter Ave., Los Gatos, Calif. 95030

Division of Ser. No. 628,444, Nov. 3, 1975, Pat. No. 4,011,984.
This application Nov. 5, 1976, Ser. No. 739,368
Int. Cl.[2] B31B *49/02*
U.S. Cl. 93—36.8 **5 Claims**



1. The method of forming a carton from components comprising an open-ended tube of polygonal cross section having inwardly foldable sealing tabs integral with at least some of the walls of the tube at at least one end of the tube and an end closure panel integral with a side wall at at least an end of the tube having said sealing tabs, said end closure panel having a polygonal configuration matching that of the tube and being marginally embossed along its free edges, which comprises the steps of:

establishing a condition for permanent interengagement between the outer surfaces of the sealing tabs and the inner surface of the end closure panel;

folding the sealing flaps inwardly and bringing the integral end closure panel into generally flush closure relation to the end of the tube with the inner surface of the end closure panel in surface engagement with the sealing tabs; and

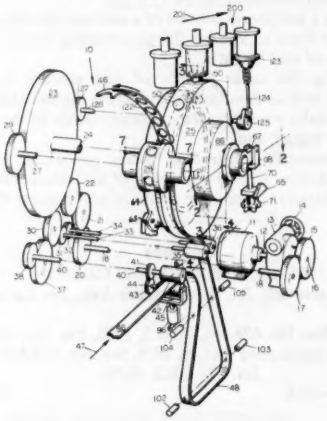
applying pressure directly on the marginally embossed portion of the end closure panel and concurrently applying pressure directly on the portion of the end closure panel confined by said marginally embossed portion to effect attachment of said end closure panel to said sealing tabs accompanied by depression of the sealing tabs by the embossed end closure panel into a downwardly sloping attitude inside the carton.

4,084,490

CONTAINER BOTTOM CUTTING APPARATUS AND METHOD

Thomas E. Doherty, Setauket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 14, 1977, Ser. No. 768,245
Int. Cl.[2] B65H *17/42*; B26D *5/20*
U.S. Cl. 93—55.1 R **17 Claims**



14. The method of cutting and translating container bottoms including the steps of;

(a) feeding a continuous web of container bottom material to a transfer wheel,

(b) advancing said web along with said wheel as it rotates,

(c) subjecting said web to the action of a rotary die that coacts with said transfer wheel,

(d) severing container bottoms from said web by means of a cutting edge positioned on said die,

(e) translating said container bottoms in spaced apart array along the peripheral surface of said transfer wheel,

(f) moving the container bottoms in a radial direction away from the surface of said wheel while said container bottoms are being rotated with said wheel,

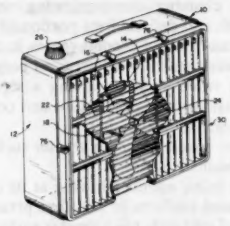
(g) depositing each of said container bottoms against a mandrel bottom so that the container bottom can be incorporated into a finished article.

4,084,491

OSCILLATED LOUVER ASSEMBLY FOR BREEZE BOX FAN

Willard Spotts, Boonville; Thomas P. Arrandale, and Glenn R. Spotts, both of Moberley, all of Mo., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Apr. 12, 1976, Ser. No. 675,711
Int. Cl.[2] F04D *25/08*
U.S. Cl. 98—121 A **7 Claims**



1. In combination, a breeze box fan having a generally rectangular case, blade means that rotate within the case to give unidirectional air discharge axially of the case, front and rear protective grills attached to said case on opposite sides of said blade means and a separate air redirection assembly constructed to be removably mounted as a unit on said fan case adjacent said front grill, said assembly including a generally rectangular frame having interconnected opposed pairs of edge sections, a plurality of separate narrow air direction vanes, opposed shaft means on each of the vanes inserted respectively in opposed openings along one pair of the edge sections for pivotally supporting the vanes crosswise to the normal air discharge on parallel pivot axes, an actuator bar, means pivotally connecting the bar to the vanes at aligned locations thereon along a single plane offset from the shaft means and on the side thereof upstream of the air flow over the vanes, operable to hold all of the vanes parallel relative to one another and to pivot them in unison, motor means mounted on said frame at a corner thereof, said front grill being cut away in alignment with said motor means to permit the latter to extend through said grill into said fan case and means connecting the output of the motor means to the actuator bar operable to reciprocate the bar and thereby oscillate the vanes about said pivot axes for side to side shifting of the vanes according to a perdetermined sweep, at least one rigid cross member conneected at its ends to the other pair of edge sections of the frame, means pivotally connecting the cross member to the vanes at aligned locations crosswise of the vanes and on centers with the pivot axes of said vanes and means for removably mounting said assembly on said fan, said means including fastener means for securing said frame to said fan case with said vanes being positioned adjacent said front grill downstream thereof in the path of air discharge from said blade means.

4,084,492

SYSTEM FOR PROVIDING LIKE COOKING MEDIUM VOLUME IN SUCCESSIVE COOKING CYCLES

Neal Sullivan, Nashville, Tenn., assignor to KFC Corporation, Louisville, Ky.

Filed Oct. 8, 1975, Ser. No. 620,560
Int. Cl.[2] A47J *27/66*
U.S. Cl. 99—330 **13 Claims**

1. A system for use in cooking food parts comprising:

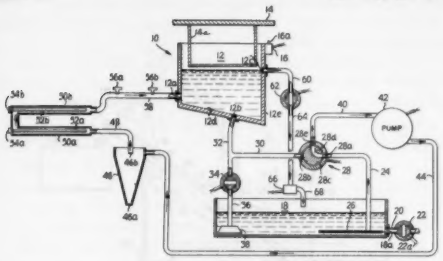
(a) a source containing cooking liquid;

(b) a cooking chamber having an inlet, an outlet and an overflow port for issuing from said chamber cooking liquid in volume exceeding a preselected volume;

(c) first conduit means connected between said chamber inlet and outlet and including means for pumping cooking liquid and first valve means having a first state providing

flow of cooking liquid from said source to said chamber and settable to alternate second state for recirculating cooking liquid from said chamber outlet to said chamber inlet;

(d) second conduit means including second valve means connected between said overflow port and said source, said second valve means having a first state providing flow of said cooking liquid therethrough and settable to



alternate second state for discontinuing flow of cooking liquid therethrough, and sensor means operated upon flow of cooking liquid through said second valve means; and

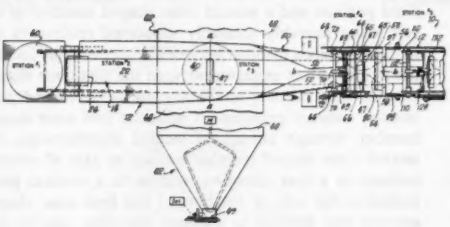
(e) control means for setting said first valve means in said second state thereof upon operation of said sensor means and including switch means connected to said second valve means for setting said second valve means in said second state thereof.

4,084,493

APPARATUS FOR PRODUCING FOODSTUFF PRODUCTS

Elias Dennis Quintana, 7601 Quebec Dr., Huntington Beach, Calif. 92648

Filed Feb. 14, 1977, Ser. No. 772,438
Int. Cl.[2] A21C 9/06
U.S. Cl. 99—450.7 **17 Claims**



1. An apparatus for producing a foodstuff product wherein a food-filler material is encapsulated within a thin sheet of dough, said apparatus comprising:

a supporting frame structure;

a conveyer system sequentially activated for transporting said sheet of dough thereon;

drive means connected to said conveyor system for sequentially moving said conveyor system longitudinally along said frame structure;

a foodstuff-dispensing means arranged to deposit a predetermined quantity of said filler onto said sheet of dough in a transverse manner to that of the travel of the conveyor system, said means being removably attached to said frame structure thereof;

a folding chute having oppositely disposed curling side walls whereby the longitudinal edges of said sheet of dough are folded inwardly thereby, said chute being positioned rearwardly of said dispensing means;

a first folding means positioned following said folding chute whereby the leading edge of said dough is folded over said filler and longitudinal edges thereof, and including a pressing means formed therewith to press down said longitudinal edges of said sheet of dough during the folding of said leading edge thereof;

a second folding means positioned rearwardly of said first folding means whereby said sheet of dough, along with said filler, is folded over said previously folded leading edge thereof;

a third folding means positioned rearwardly of said second folding means whereby the filler material is further folded over the trailing edge of said sheet of dough, wherein said foodstuff produce is completely formed thereby; and

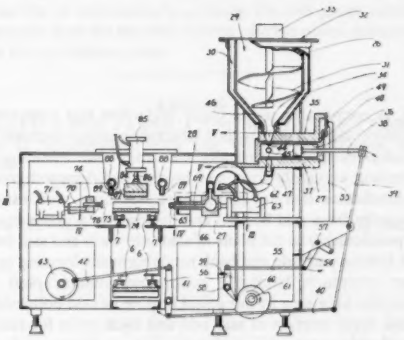
a sequential actuating means interconnecting said folding means and said conveyor system to said drive means.

4,084,494

FOOD PROCESSING DEVICE

Masatsugu Ezaki, 29-3-chome, Kohama-honmachi, Sumiyoshi-ku, Osaka, Japan

Filed Jan. 21, 1976, Ser. No. 651,035
Int. Cl.[2] A21C 9/06
U.S. Cl. 99—450.7 **1 Claim**



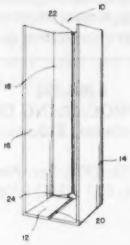
1. A food processing device comprising a conveyor for intermittently conveying cylindrical shell foods having a pair of open ends, a keep plate positioned above the conveyor and mounted for reciprocation toward and away from the conveyor when the conveyor is stopped to hold the shell foods, measuring means for measuring pasty flavour, an extruding nozzle for extruding the measured pasty flavour into the shell foods on the conveyor, the extruding nozzle being reciprocably mounted and having an open end which is reciprocable when the conveyor is stopped between a first position in which the open end is positioned outside of a cylindrical shell and a filling position in which the open end is positioned slightly inwardly of one of the open ends of a cylindrical shell, a stopper mounted for reciprocation toward and away from the open end of the shell food opposite the extruding nozzle when the conveyor is stopped, and an air jet nozzle for jetting air into the flavour inserted cylindrical shell foods and for thinly coating the pasty flavour on the inner surface of the shell food, the air jet nozzle being reciprocably mounted and having an open end which is reciprocable when the conveyor is stopped between a first position in which the open end is positioned outside of a cylindrical shell and a coating position in which the open end is positioned slightly inwardly of one of the open ends of a cylindrical shell, the air jet nozzle being spaced from the extruding nozzle in the direction in which the conveyor advances whereby the open ends of the extruding nozzle and the air jet nozzle are substantially simultaneously reciprocated into their second positions into cylindrical shell foods spaced along the conveyor when the conveyor is stopped, whereby each food shell is treated first by an extruding nozzle then by a downstream airjet nozzle.

4,084,495

APPARATUS FOR COLLECTING AND HANDLING RECYCLEABLE PAPER

Roy A. Paul, 2902 Wycliff Rd., Raleigh, N.C. 27607

Division of Ser. No. 546,412, Feb. 3, 1975, Pat. No. 3,983,799.
This application Sep. 29, 1976, Ser. No. 728,462
Int. Cl.[2] B65B *13/02*
U.S. Cl. 100—34 2 Claims



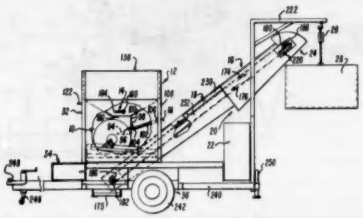
1. A recycleable waste paper collection box comprising: a relatively tall and narrow box structure having a bottom, a pair of laterally spaced vertically extending side retaining walls extending upwardly from said bottom and disposed generally perpendicular thereto, and a back retaining wall extending upwardly from said bottom and disposed in a plane generally perpendicularly to the plane of said side walls and said bottom, said bottom and side and back retaining walls forming an open front receptacle having a continuous uninterrupted waste paper stacking area forming said bottom of said collection box to the upper portion of said side and back walls for receiving recycleable waste paper therein and confining such waste paper such that access may be readily gained to said collection box and wherein paper may be deposited in said collection box to form a stack of paper; a first elongated strap groove formed about the interior side of said back wall and extending in a generally straight line from a top portion of said back wall to a lower portion thereof; a second elongated strap groove formed about the upper surface of said bottom and which extends from a rear edge of said bottom to a front portion thereof with said second elongated strap groove being aligned with said first strap groove and wherein both said first and second strap grooves are adapted to receive a baling strap therein with the baling strap being used to bale a stack of waste paper formed within said collection box; said first and second strap grooves being grooved into the surface of said back wall and said bottom respectively, with each groove being a depth less than the thickness of the member in which they are formed such that each groove includes a groove bottom and two opposed groove sides, thereby assuring that said back wall and bottom are structurally continuous; and an opening formed about the lower edge of said back wall between and adjacent said first elongated strap groove with said opening so disposed with respect to said back wall and bottom such that the fingers of an individual may be inserted through said opening so as to manipulate and guide a portion of a strap from the first groove around the rear lower edge of the formed stack of paper within said collection box and into said second elongated strap groove in the upper surface of said bottom, thereby allowing said strap to be properly threaded and guided around the formed stack of waste material within said collection box such that the strap may be fastened around the entire formed stack to yield a bale of waste paper.

4,084,496

METHOD AND APPARATUS FOR CRUSHING AND SEPARATING METALLIC CONTAINERS

John E. Ehernberger, Westminster, and Bud Mazza, Denver, both of Colo., assignors to G.B.C., Inc., Lakewood, Colo.

Continuation-in-part of Ser. No. 681,829, Apr. 30, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 766,601
Int. Cl.[2] B30B *3/04*
U.S. Cl. 100—35 36 Claims



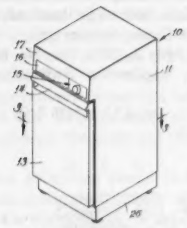
28. A method of crushing metallic containers comprising:
supplying containers to a hopper means;
feeding the containers from the hopper means to a pocket means for receiving containers in a container crushing means for crushing the containers, the pocket means being defined by a pair of rotatable cone shaped members in the crushing means, each cone shaped member having oppositely extending conically shaped container engaging surfaces and means on each of said container engaging surfaces for transferring force from the cone shaped members to the containers in the pocket means, a first cone shaped member of the pair being rotatably supported in a fixed position and a second cone shaped member of the pair being movably rotatably supported relative to the first cone shaped member between a first inwardly located position of direct engagement with the first cone shaped member and variable outwardly displaced second positions of indirect engagement with the first cone shaped member through containers located therebetween, the second cone shaped member having an axis of rotation inclined in a first direction relative to a vertical plane including the axis of rotation of the first cone shaped member and inclined in a second direction relative to a horizontal plane including the axis of rotation of the first cone shaped member;
resiliently biasing the second cone shaped member into direct engagement with the first cone shaped member in the first position and into indirect engagement with the first cone shaped member through containers located therebetween in the variably outwardly displaced second positions with sufficient force to crush the containers as they pass between the container engaging surfaces of the cone shaped members; and
rotating the first cone shaped member whereby the second cone shaped member is rotated by direct transfer of force from the first cone shaped member to the second cone shaped member, containers in the pocket means are drawn toward the portions of the cone shaped members which are in engagement by interaction of the containers and the force transferring means on the container engaging surfaces of the cone shaped members and the containers are crushed as they pass between the container engaging surfaces of the cone shaped members.

4,084,497

REFUSE COMPACTOR

Aman Ullah Khan, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 4, 1977, Ser. No. 774,329
Int. Cl.[2] B30B *1/18*
U.S. Cl. 100—53 26 Claims



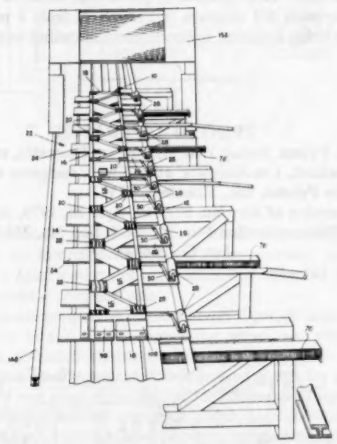
1. In a refuse compactor structure including a ram and a carrier for removably carrying an upwardly opening container in which refuse may be collected to be compacted by movement of said ram forcibly downwardly into said container against collected refuse therein, the improvement comprising:
sidewall means arranged to surround said container; and
means for causing the sidewall means to be constricted as a result of a preselected movement of said ram during a compacting cycle to provide a lateral support about said container during the compacting operation.

4,084,498

TRUSS MAKING APPARATUS

Austin S. Weaver, Zeeland, Mich., assignor to Ottawa Roof Truss, Inc., Zeeland, Mich.

Filed Jul. 2, 1976, Ser. No. 702,055
Int. Cl.[2] B30B *3/02*
U.S. Cl. 100—210 14 Claims



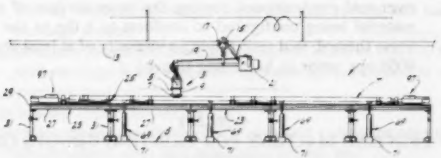
1. An apparatus for making trusses having parallel first and second elongated truss plates, end truss plates at the ends of the first and second truss plates and angle truss plates disposed in bracing relationship between the first and second truss plates, the apparatus comprising in combination:
a supporting base;
a first rail mounted on the base;
a second rail mounted on the base;
means for evenly and simultaneously adjusting spacing between the first and second rails;
a plurality of first positioning pads adjustably secured to the first rail in spaced relationship to each other;
the end and another of the first positioning pads having means for retaining a first elongated truss plate parallel to the first rail;
a plurality of second positioning pads adjustably mounted on the second rail in spaced relationship to each other;
at least the end ones of the first and second positioning pads having stop means to retain an end truss member thereon perpendicular to the first and second rails;
the end and another of the second positioning pads having means for retaining a second elongated truss member parallel to the first and second rails;
means on the first and second positioning pads for retaining nail plates thereon in a given predetermined location;
means on the second positioning pads for applying pressure to the second elongated truss plate to firmly seat all of the truss plates together prior to seating of the nail plates;
the first and second pads being so spaced and aligned so as to support the opposite ends of angle truss plates extending between the first and second truss plates; and
means for at least partially pressing the nail plates simultaneously into the top and bottom of truss plates positioned at the positioning pads.

4,084,499

APPARATUS FOR FABRICATING WOOD STRUCTURES

Walter G. Moehlenpah, 9906 Old Warson Rd., Ladue, Mo. 63124

Filed Jan. 21, 1977, Ser. No. 761,488
Int. Cl.[2] B30B *9/00*
U.S. Cl. 100—231 12 Claims



1. Apparatus for fabricating wood structures, such as trusses of the type having parallel upper and lower chord members and web members extending between the upper and lower chord members, said apparatus comprising a press having an upper and a lower platen which are relatively movable toward and away from one another for pressing nailing plates into two or more of the wood members of the truss from above and below, means for supporting said press for movement along the truss being fabricated into an operating position at a first station for simultaneously driving nailing plates into the wood members from above and below at said first station and for movement from said first station into its operating position at another station, and means for supporting the wood members which are to be joined together by said nailing plates, said supporting means comprising a plurality of elongate frames securable together in end-to-end abutting relation so as to form a support for the truss to be fabricated, each of said frames having a track extending from one end to the other thereof, a plurality of wood member support platforms carried by said track for supporting the upper and lower chord members and the web members of the truss to be fabricated with the platforms for the upper chord members and the platforms for the lower chord members being arranged in back-to-back arrangement on said track and being adjustably movable relative to one another along said track for supporting the wood members at locations along the truss corresponding to the joints of the truss, each of said platforms constituting one of said stations, each said frame having two or more legs for supporting the frame on a base, each of said frames having means thereon

cooperable with means on an adjacent frame for aligning the tracks of said adjacent frames in end-to-end abutting relation, and means for releasably clamping said adjacent frames together in end-to-end abutting relation.

4,084,500

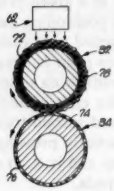
SYNTHETIC RESIN CURED IN PLACE ROTARY EMBOSSING COUNTER ROLLER

William E. Brown; Ramon J. Magee, both of Independence, and Dennis R. McCoy, Gladstone, all of Mo., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Continuation-in-part of Ser. No. 656,361, Feb. 9, 1976, abandoned. This application Jan. 12, 1977, Ser. No. 758,677

Int. Cl.² B44B *5/02*

U.S. Cl. 101—28 **8 Claims**



1. A rotary counter roller comprising:

a cylindrical core;

a continuous wrap of reinforcing roving material comprising individual lays of continuous glass fiber strands spirally wound in essentially one direction circumferentially about said core under tension and bonded to the core along the length of the latter; and

at least one layer of hardened ultraviolet cured resin material over said pre-tensioned roving, the outer surface of said material being configured to conform to a die as the reverse thereof, said resin having a viscosity of at least about 6000 cps. prior to hardening thereof.

4,084,501

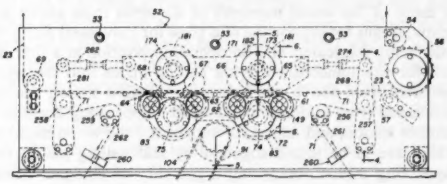
PRINTING MACHINE FOR PRINTING GROUPS OF SYMBOLS

Daniel Kerwin, Lombard; Walter B. Zoberis, Oak Lawn; John W. Grec, Westmont, and James A. McDonald, Palos Heights, all of Ill., assignors to The Meyercord Co., Carol Stream, Ill.

Filed Jun. 21, 1976, Ser. No. 698,052

Int. Cl.² B41F *5/06*

U.S. Cl. 101—76 **17 Claims**



1. A machine for printing a plurality of grouped symbols on a rapidly moving web, comprising an angularly adjustable printing cylinder associated with each symbol of said group, each of said cylinders having a plurality of angularly spaced printing elements on the periphery thereof, said plurality of printing elements of each cylinder being arranged in a row which extends longitudinally of said web, the printing element of each row closest to the web being in printing position for printing the symbol associated therewith, drive means for cyclically moving said cylinders against and away from the web and thereby printing said symbols on said web, said cylinders being spaced apart in the direction of moveement of the web and said printing elements of the respective cylinders being spaced apart laterally of said direction of movement relative to each other and forming an associated group of printing elements, whereby said cylinders cooperate to print said grouped symbols in laterally spaced relation.

4,084,502

ELECTRIC ACUTATING DEVICE

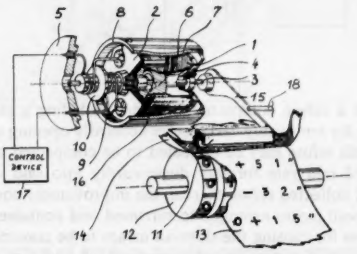
Marc Heyraud, Les Geneveys-sur-Coffrane, and Andre Martin, La-Chaux-de-Fonds, both of Switzerland, assignors to Portescap, La Chaus-de-Fonds, Switzerland

Filed May 3, 1976, Ser. No. 682,796

Claims priority, application Switzerland, May 2, 1975, 5691/75

Int. Cl.² H01F *7/08*

U.S. Cl. 101—93.29 **7 Claims**



1. An electric actuating device for producing limited angular displacements, comprising an ironless coil mounted for rotation within the air gap of a magnetic circuit and connected to a source of electric control pulses, the poles of the magnetic circuit and the coil being arranged for producing a torque upon occurrence of a control pulse, and further comprising mechanical means for limiting the angle of rotation at least in the direction of the torque and magnetic return means for producing a return torque acting on the coil for bringing the same back into a rest position, said magnetic return means comprising a member of magnetically permeable material associated with the rotor for rotation therewith, at least a part of said member being arranged in eccentric relationship with the rotor axis.

4,084,503

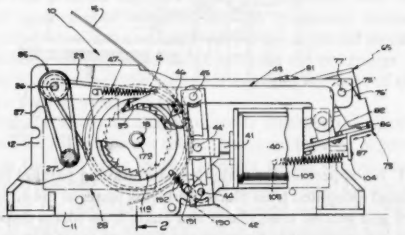
PRINTER APPARATUS

John D. Pylant, Irvine; Paul R. Lozeau, Placentia, and Newton R. Packard, Los Alamitos, all of Calif., assignors to Sheldon-Sodeco Printer, Inc., Elmsford, N.Y.

Continuation of Ser. No. 572,067, Apr. 28, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,859

Int. Cl.² B41J *7/70*

U.S. Cl. 101—96 **16 Claims**



1. In compact printer apparatus operable to rapidly print characters on a print sheet in lines and columns,

a. a frame,

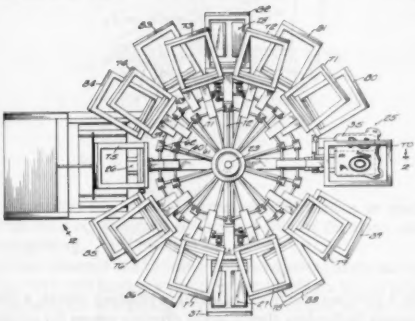
b. a continuously rotating rotary drum carried by the frame and having type font means thereon,
c. hammer means carried by the frame for movement toward and away from the drum and the type font means thereon during rotation of the drum,
d. an inked ribbon and carrier therefor carried by the frame to feed a local ribbon extent between the hammer means and rotating drum, there being ribbon advancing means engaging the ribbon and operable to effect endwise transport of the ribbon onto and off the carrier,
e. print sheet advancing means carried by the frame to advance the sheet endwise between the drum and said local ribbon extent, and
f. drive means operatively connected with the ribbon advancing means and with the sheet advancing means to interruptedly advance the sheet and the ribbon advancing means,
g. said print sheet advancing means including a sheet advancing friction rotor peripherally and frictionally engageable with the sheet, the drive means including shoulders on the rotor, and pawl means engageable with the shoulders to interruptedly rotatably index the rotor, the frame supporting said friction rotor to rotate independently of but coaxially with said continuously rotating drum at one end thereof, the friction rotor periphery being annular and having a diameter approximately the same as the drum outer diameter.

4,084,504

MULTIPLE TIER SCREEN PRINTER

Alvin J. Fuchs, Milwaukee, Wis., assignor to Medalist Industries, Inc., Milwaukee, Wis.

Filed Apr. 28, 1977, Ser. No. 791,764
Int. Cl.² B41F *15/10, 15/36*
U.S. Cl. 101—115 **6 Claims**



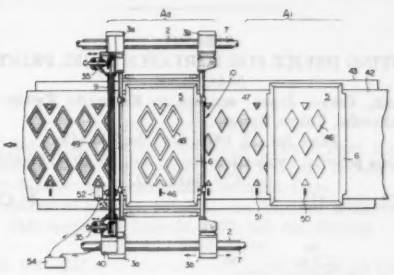
1. Apparatus for printing on flexible material comprising:
a lower, an intermediate and an upper carriage means arranged axially adjacent each other and mounted for rotation about a common axis,
platen means supported by said lower carriage means,
a first tier of silk screen supporting means and silk screen means mounted thereon, said supporting means being mounted on said intermediate carriage means for pivoting toward and away from said platen means, said supporting means being spaced angularly about said axis, and
a second tier of silk screen supporting means and silk screen means mounted on said supporting means, said supporting means of said second tier being mounted on said upper carriage means for pivoting toward and away from said platen means, said screen supporting means of said second tier being spaced angularly about said axis at angles which permit said supporting means of said second tier to pivot to said platen means in a path between certain of the supporting means in said first tier which is supported on said intermediate carriage means.

4,084,505

DEVICE FOR ADJUSTING PHASE OF FLAT SCREEN

Shiro Ichinose, 11-8, 4-chome, Shinohara, Kita-machi, Nada-ku Kobe-shi, Hyogo-ken, Japan

Filed Jun. 14, 1976, Ser. No. 695,928
Int. Cl.² B41F *15/10, 15/36*
U.S. Cl. 101—123 **7 Claims**



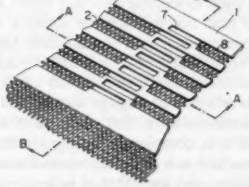
1. A flat screen printing machine wherein a web of material is advanced in a first direction past a printing station wherein said printing station includes:
a printing screen for printing a pattern on said web;
carriage means for supporting said printing screen above said web;
drive means for moving said carriage means and said printing screen at the same speed as said web so that the pattern on the printing screen can be transferred to said web accurately during printing;
means for mounting said printing screen on said carriage means wherein said mounting means includes means allowing relative movement between said screen and said carriage means;
adjustment means for driving said screen to move relative to said carriage both with and opposite to the direction of carriage motion;
indicating means on said web;
detector means rigidly mounted with said screen for sensing misalignment with said indicating means, and
motor means activated by said detector means to drive said adjustment means until said detector means is aligned with said indicating means so that the pattern on said screen remains properly aligned with the web during the printing process.

4,084,506

METAL MASK FOR USE IN SCREEN PRINTING

Mitsuo Nakatani, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 3, 1976, Ser. No. 738,395
Claims priority, application Japan, Nov. 7, 1975, 50-133096
Int. Cl.² B41F *15/36*
U.S. Cl. 101—127 **2 Claims**



1. A metal mask for screen-printing comprising a metal plate having a printing pattern layer including at least one first printing pattern opening portion for forming first printed lines

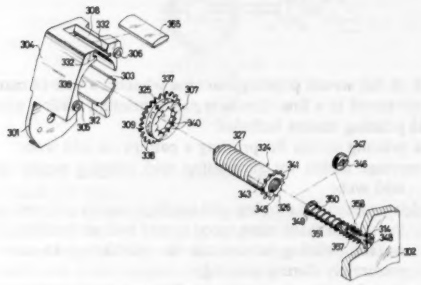
each having a width no larger than 300 microns and at least one second printing pattern opening portion for forming second printed lines each having a larger width than that of said first printed lines, and a mesh layer consisting of fine mesh-like lines formed on said printing pattern layer, wherein said mesh layer is provided over said second printing pattern opening portion, while said first printing pattern opening portion is free from said mesh layer.

4,084,507

PRINTING DEVICE FOR PORTABLE LABEL PRINTING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,443
Claims priority, application Japan, Jul. 15, 1975, 50-85869
Int. Cl.² B41J *1/32*
U.S. Cl. 101—110 **14 Claims**



1. A printing device for a labeling machine, or the like, comprising:

a first array of wheels arranged side-by-side on a first common axis; a frame for supporting said first array of wheels; said wheels of said first array each having an engageable periphery;

a second array of type wheels arranged side by side on a second common axis, and all said type wheels also being supported on said frame; each said type wheel being provided with a respective set of imprintable types; each said type wheel having a periphery that is engageable with said periphery of a wheel of said first array such that rotation of a said wheel of said first array rotates the respective said type wheel; each said set of types being attached to a respective said type wheel to be moved to place a different said type at a print position by means of rotation of the corresponding said type wheel;

all said wheels of said first array having a respective central opening therethrough, and each said central opening having a respective first cross-section and being defined by a respective profiled surface having a respective first profile; said central openings being on said common axis; all said first profiled surfaces being identically shaped and sized;

an indexing shaft extending into said frame and adapted and shaped to pass through and be slidable through all said central openings; a pinion on said shaft; said pinion having a second cross-section that is smaller than all said respective first cross-sections; said pinion having a second profile that is adapted to engage any of said respective first profiled surfaces at a first rotative orientation of said pinion and to be completely disengaged from that said first profiled surface at a different, second rotative orientation of said pinion, and such that at said second orientation of said pinion, there is a clearance space between said pinion and said first profiled surface of a said wheel in which said pinion is then located;

wheel rotative position establishing means for establishing discrete rotative positions for every said wheel of said first array such that at every established discrete position of every said wheel of said first array, all said profiled surfaces are identically aligned, whereby said pinion at its said second orientation may freely pass through all said wheel central openings with clearance space;

said frame comprising a side frame extending axially the width of said first array of wheels, said side frame having a blind hole therein defined by a side wall and extending axially of said wheels; said first array of wheels all sitting in and being guided for rotation by said side wall of said blind hole; said blind hole side wall and said periphery of all said first array wheels being respectively profiled such that said first array wheels are supported by their said peripheries in said blind hole for rotation around their said axis;

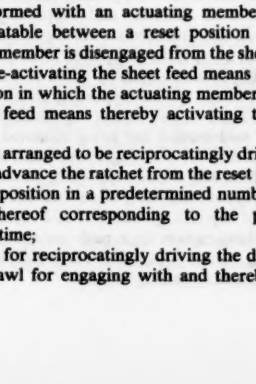
an opening in said blind hole side wall for enabling engagement between each said first array wheel and its respective said type wheel.

4,084,508

OFFSET PRINTING MACHINE COMPRISING IMPROVED CONTROL MECHANISM

Tamaki Kaneko, and Tugio Okuzawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,022
Claims priority, application Japan, Aug. 18, 1975, 50-99932
Int. Cl.² B41F *7/06*
U.S. Cl. 101—142 **8 Claims**



1. In a printing machine including a printing means, a sheet feed means for feeding sheets to the printing means for printing and a control member movable between a neutral position for de-activating the printing means and sheet feed means and a print position for activating the printing means, an improvement for activating the sheet feed means after a predetermined length of time after the control member is moved from the neutral position to the print position, said improvement comprising the combination of:

a ratchet formed with an actuating member, the ratchet being rotatable between a reset position in which the actuating member is disengaged from the sheet feed means thereby de-activating the sheet feed means and an actuating position in which the actuating member engages with the sheet feed means thereby activating the sheet feed means;

a drive pawl arranged to be reciprocatingly driven to engage with and advance the ratchet from the reset position to the actuating position in a predetermined number of reciprocations thereof corresponding to the predetermined length of time;

drive means for reciprocatingly driving the drive pawl;

a holding pawl for engaging with and thereby preventing

rotation of the ratchet from the actuating position to the reset position;

reset means actuated by the control member to move the drive pawl and the holding pawl out of engagement with the ratchet thereby allowing the ratchet to move to the reset position when the control member is moved from the neutral position to an intermediate position between the neutral position and the print position, the reset means moving the drive pawl and the holding pawl into engagement with the ratchet when the control member is moved from the intermediate position to the print position; and

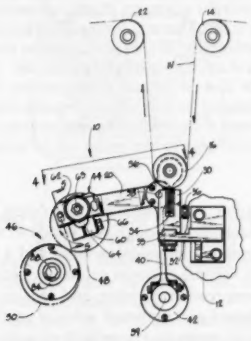
latch means actuated by the control member for disconnecting the drive means from the drive pawl when the control member is in the neutral position and connecting the drive means to the drive pawl when the control member is moved from the neutral position to the print position, the latch means continuing to disconnect the drive means from the drive pawl when the control member is in the intermediate position.

4,084,509

APPARATUS FOR PRINTING ON AN ADVANCING WEB

Lawrence W. Schoppee, Springfield, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed Sep. 20, 1976, Ser. No. 724,861
Int. Cl.² B41F *3/54, 3/64, 3/44*
U.S. Cl. 101—261 **6 Claims**



1. Apparatus for cyclically printing information at spaced intervals on a continuously advancing web of the sheet material comprising:

a printer situated at a printing station adjacent to the advancing web and having a printing head facing a broad side of the web for producing printed information on the broad side;

a web guide roller supported at the printing station adjacent the printing head for free rotation about its own axis to guide the advancing web through the station;

a linkage including a rocker arm mounted at one end for rocking motion about a given axis and pivotally connected at the opposite end with a movable link to provide a shiftable pivot axis for the link at said opposite end of the rocker arm, the rocking motion of the arm about the given axis at said one end being accomadated by shifting of the pivot axis for the link at said opposite end the movable link supporting the roller with the advancing web guided thereon for shifting motion back and forth over the printing head with the shiftable pivot axis parallel to the axis of the roller; and

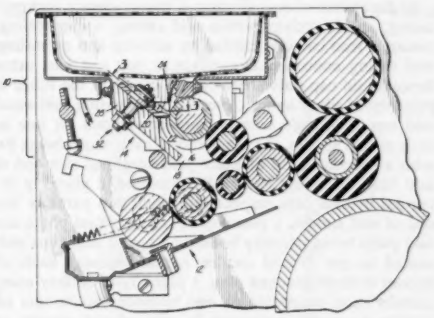
drive means connected to the linkage for cyclically rocking the arm, shifting the pivot axis for the link and moving the link and roller back and forth relative to the printing head and also simultaneously tilting the link about the shiftable pivot axis to sweep the roller and web over the printing head in one direction opposite the direction of web advancement with the web in contact with the head and to return the web and roller in the reverse direction with the advancing web out of contact with the head.

4,084,510

INK FOUNTAIN

Roy C. Schweitzer, Hoffman Estates, and Lee B. Fiori, Leyden Township, Cook County, both of Ill., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 607,238, Aug. 25, 1975, abandoned.
This application May 26, 1977, Ser. No. 800,814
Int. Cl.² B41F *31/04*
U.S. Cl. 101—365 **3 Claims**



1. An ink fountain for a lithographic duplicator comprising:

a fountain roller;

a blade support anvil adjacent the fountain roller and having a flat blade support and guiding surface;

an ink supporting and doctor blade with its long axis parallel to said roller and provided with an edge portion out of contact with, but in close proximity to, the surface of said roller defining therewith a minute ink metering gap, said blade having a flat body portion lying in contact with the blade support surface of said anvil and being longitudinally flexible in a widthwise direction to a degree such that segments of its length are somewhat independently movable so as to allow adjustment in conformity with roller surface variations to achieve a gap of the required degree of minuteness and uniformity, said blade including a plurality of follower openings spaced along its length; and

independently acting adjusting devices mounted on said anvil, each positioned to enter one of said follower openings and coact with the edges thereof, said adjusting devices each comprising:

a post rotatable on the anvil passing through the corresponding blade opening and carrying a first eccentric cam for coarse adjustment;

means for clamping the first eccentric cam in desired rotary position;

a second eccentric cam embracing the first eccentric cam and rotatable thereon, said second eccentric cam including a cam profile for fine adjustment engaging the edges of its corresponding follower opening; and

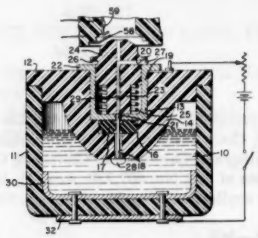
drive means for setting the second eccentric cam in desired rotary position.

4,084,511

ELECTROLYTIC TIMING ELEMENT

Benjamin W. Svrjcek, Jr., Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 7, 1960, Ser. No. 34,598
Int. Cl.[2] F42B *5/08*
U.S. Cl. 102—70.2 GA **4 Claims**



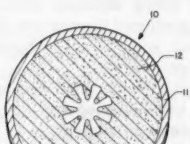
1. An electro-chemical interval timing device comprising a casing, an electrolyte within said casing, a cap sealing said casing, a lead cathode carried by said cap and extending into said casing contained electrolyte at one end and extending beyond said cap outwardly of said casing at the other end, a plurality of silver anodes, means for mounting said anodes in said cap to provide outside connection posts for one end of each of said anodes, the other end of each anode being formed with a rounded head of exact predetermined size and shape, said head extending into said electrolyte, a plurality of cups carried by said caps respectively, each cup partially housing one of said anodes, a plurality of spring biased plugs, each of said plugs being partially housed by one of said cups and connected to one of said anodes, means retaining each of said anodes to their attached plug, a plurality of battery energized circuits each connected to said cathode and to one of said anodes, a variable resistance in each of said circuits, means initiating said battery energized circuits, a second plurality of circuits, each of said second circuits including an open switch positioned adjacent one of said spring biased plugs whereby the energization of said battery energized circuits will cause current to pass through the electrolyte and dissolve the heads of said anodes at an equal rate, said plugs and their attached anodes being released by the dissolving of said anode heads in accordance with their different sizes and shapes.

4,084,512

PRESSURE RELIEF CONSTRUCTION FOR CONTROLLED COMBUSTION OF ORDNANCE ITEMS

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,484
Int. Cl.[2] F42B *13/12*
U.S. Cl. 102—103 **10 Claims**



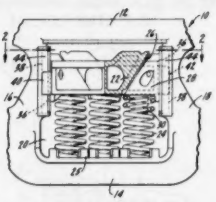
1. A casing structure for an ordnance item comprising:
a wall having an inner and an outer surface, said inner surface at least partially defining a chamber for containing high energy fuel, said outer surface defining at least one cavity and corresponding zone of reduced wall thickness;
a thermally insulating doubler rigidly attached to said outer surface and having at least one aperture aligned with each cavity; and
a thermally conducting plug occupying said cavity and aligned aperture.

4,084,513

RAILROAD CAR SIDE FRAME CONSTRUCTION

Robert L. Bullock, Lombard, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Continuation-in-part of Ser. No. 590,291, Jun. 25, 1975, abandoned. This application Aug. 25, 1976, Ser. No. 717,517
Int. Cl.[2] B61F *5/06, 5/12, 5/50*; F16F *1/06*
U.S. Cl. 105—197 DB **1 Claim**

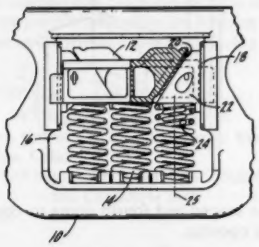


1. In combination, a railroad truck side frame having a window, a bolster extending through said window, said side frame including an upper compression member and a lower tension member, spaced vertical columns extending between and connecting said compression member and tension member and defining the inboard and outboard sides of said window, said bolster having lugs projecting from both sides thereof on opposite sides of said columns, a widened area forming a reinforcing mass on the same side of each vertical column extending away from the side frame on the inboard side, with the opposite side of each column being substantially coplanar with the side frame, the widened area on each vertical column extending a vertical distance less than the distance between said tension member and compression member, the space between lugs on each side of the bolster being substantially greater than the width of said side frame, and being slightly greater than the distance between the outside of said widened area and the opposite side of said vertical column, said lugs being positioned adjacent and extending outside of said widened area and coplanar side, a wear plate on each vertical column facing the bolster, with the surface of each wear plate facing said bolster being substantially coplanar with a surface on said widened area facing said bolster, a pocket in each side of the bolster having a wear plate and a friction member in each pocket opposite its corresponding wear plate, relative rotation between said bolster and side frame causing wear contact at diagonally opposed portions of said bolster and side frame, said diagonally opposed portions being: each widened area reinforcing mass and the opposing bolster area adjacent one of said lugs (**48**), and between opposing edge portions of each vertical wear plate and its corresponding friction member (**58**), a line drawn between said diagonally opposed bolster and side frame portions (**48** and **58**) crossing the bolster center line (**50**) inboard of the side frame center line (**52**).

4,084,514
DAMPING RAILWAY TRUCK BOLSTER FRICTION SHOE

Robert L. Bullock, Lombard, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Continuation-in-part of Ser. No. 590,292, Jun. 25, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,827
Int. Cl.[2] B61F 5/06, 5/12, 5/50; F16D 65/04
U.S. Cl. 105—197 DB 10 Claims

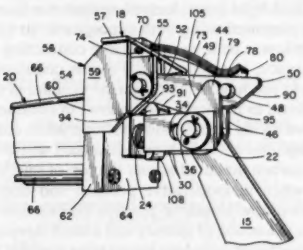


1. A friction member for use in the bolster pocket of a stabilized railroad car truck including a friction surface adapted to bear against a generally flat slanted wear surface within the bolster pocket, said friction surface having a generally flat portion of substantial length generally conforming to the generally flat slanted bolster pocket wear surface and an adjoining arcuate portion of substantial length, gradually diverging from the generally flat slanted bolster pocket wear surface, said generally flat portion being tangent to said adjoining arcuate portion and extending from the area of tangency to one end of said friction surface, the arcuate portion extending from the area of tangency to the other end of said friction surface.

4,084,515
LOCKING MECHANISM FOR HOPPER DOOR ACTUATOR ASSEMBLY

Andrew M. Kunz, Dolton; Donald B. Yates, Park Forest, both of Ill., and Richard L. Tuck, Highland, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sep. 16, 1976, Ser. No. 723,862
Int. Cl.[2] F15B 15/26; B61D 7/28
U.S. Cl. 105—240 10 Claims



9. A locking device for a piston and cylinder and an actuating lever pivoted intermediate its ends to the piston on a transverse axis, said lever having first and second legs and said one leg at one side of said axis adapted for connection to a mechanism operable thereby, said device comprising:

mounting means on the cylinder,

a latch pivoted at one end above the piston to said mounting means on an axis generally parallel with said transverse axis and having means at the other end providing a locking surface facing toward the cylinder, a

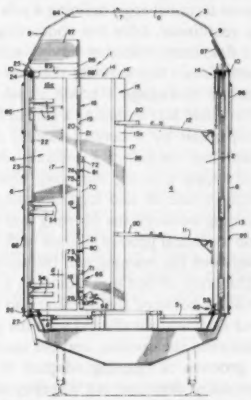
generally planar locking surface on the second leg at the opposite side of said axis facing away from the cylinder in the locked position and engaging behind said cylinder facing surface on said latch,

and means on said latch and piston for lifting said latch to a position disposing said surface thereon above said locking surface on the leg pursuant to extension of the piston for operating said lever and for lowering said latch upon said leg being located in loading position in consequence of and attendant to said piston retracting.

4,084,516
FOLDABLE SLIDABLE VEHICLE END ENCLOSURE

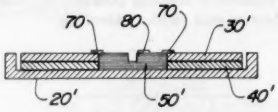
Chandrakant D. Ravani, Farmington; James C. Robertson, Ypsilanti, and Jaroslaw J. Rostafinski, Ferndale, all of Mich., assignors to Portec, Inc., Oak Brook, Ill.

Filed Mar. 22, 1977, Ser. No. 780,226
Int. Cl.[2] B60J 5/06, 5/10; B61D 17/06, 19/00
U.S. Cl. 105—368 R 15 Claims



1. An end enclosure for a transport vehicle having a floor and two side walls defining an end opening therebetween including, a pair of door assemblies each having an inner door panel and an outer door panel, each said panel provided with an outside face and an inside face and having an inner edge and an outer edge, intermediate hinge means pivotally joining the respective inner edge of each said outer panel to the respective outer edge of each said inner panel of each said door assembly in a manner providing a vertically extending clearance therebetween and whereby said inner and outer panels may be folded into a juxtaposed parallel condition, slidable vertically disposed hinge means carried by each said outer panel adjacent its outer edge, hanger means within said vehicle adjacent each said side wall and connected to said slidable hinge means, track means fixedly disposed within said vehicle and extending longitudinally of each said side wall, each said hanger means supported by a respective one of said track means to permit sliding displacement of said folded door assemblies to and from a stored position within said vehicle in a direction parallel to said side wall, intermediate lock means carried by each said door panel adjacent said vertically extending clearance and independently operable to lock each said pair of joined door panels to one another in a co-planar position as when disposed in a closed position normal to said vehicle side walls and storage lock means carried by said vehicle and operable to engage and retain said folded door assemblies in said stored position within said vehicle.

4,084,517
COLLAPSABLE TABLE
Westphal Claude Guess, 2121 Leadville, Boise, Id. 83706
Filed Jun. 13, 1977, Ser. No. 806,003
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—153 **9 Claims**



1. A collapsable table comprising:

a table top having substantially planar upper and lower horizontal surfaces;

a leg receiving block securely attached to the undersurface of said table top, said block including a pair of rectilinear, horizontally extending, intersecting notches adapted to interlockingly engage a pair of table legs;

a pair of table legs; each leg having a thickness equal to one-half the thickness of said block; each leg having vertical coplanar opposing surfaces; each of said legs including an uppermost terminal edge defining a pair of horizontally extending, rectilinear, table top contacting surfaces separated by a first recede portion having a horizontally extending, rectilinear, top surface, the first recede portion being operable to engage a notch in said leg receiving block; each of said legs including a pair of floor contacting surfaces separated by a central second recede portion; each of said legs including a centrally located opening adapted to encase said leg receiving block when in the stored position; one of said legs including a vertical slit communicating between the opening and the first recede portion and a vertical groove aligned with the slit communicating between the opening and the second recede portion; and the other of said legs including a vertical groove communicating between the opening and the first recede portion and a vertical slit aligned with the groove communicating between the opening and the second recede portion; the grooves of one leg adapted to interlockingly engage the slit of the other leg whereby said legs may be juxtaposed over one another at right angles one to the other.

4,084,518
SWIVEL DRAWER ASSEMBLY
David T. Carlson, 923 S. Cardiff, Anaheim, Calif. 92805
Filed Apr. 4, 1977, Ser. No. 784,481
Int. Cl.[2] E05G *7/00*
U.S. Cl. 109—19 **7 Claims**

1. A swivel drawer assembly adapted to be mounted in an opening in a wall, or the like, comprising:

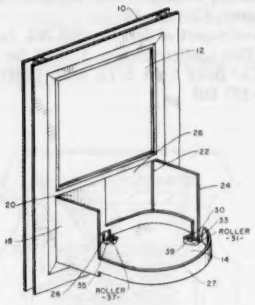
a tray pivotally mounted to one side of said opening for swivel movement through said opening from one side of said wall to the other in a horizontal plane about a first vertical axis disposed at said one side of said opening;

first and second vertical doors mounted on said tray extending at right angles to one another from said first vertical axis for swivel movement with said tray;

third and fourth vertical doors pivotally mounted to the opposite side of said opening for rotation about a common second vertical axis at said opposite side of the opening;

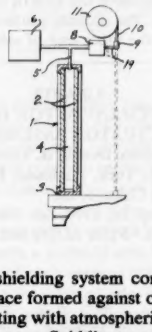
cam means formed on said tray coupling said third and fourth vertical doors for rotation with said tray;

whereby swivel movement of said tray to one side of said wall causes said first and third doors to come together closing said opening and swivel movement of the tray about the first vertical axis to the opposite side of said wall



causes the second and fourth doors to come together to close said opening.

4,084,519
ANTI-BURGLAR WINDOW SHIELDING SYSTEM AND LATCH MECHANISM THEREFOR
Ulderic Sylvio Hill, P.O. Box 68, Rock Island, County of Stanstead, Canada
Filed Apr. 27, 1976, Ser. No. 680,965
Int. Cl.[2] G08B *13/04*
U.S. Cl. 109—42 **5 Claims**



1. An anti-burglar shielding system comprising a window having a fluid-tight space formed against one face thereof and capable of communicating with atmospheric air upon breakage of said window, a bellows, a fluid line connecting said bellows with said space, a vacuum pump means communicating with said space to produce at least a partial vacuum in the latter and in said bellows to maintain said bellows in contracted position, said bellows taking an expanded position when communicating with atmospheric air upon breakage of said window, a window shielding curtain mounted across the top of said window, held in a roll when in inoperative position and deploying to an operative window shielding position on one side of said window under the action of gravity and a latch device to hold said shielding curtain in rolled-up inoperative position and operable by expansion of said bellows to release said shielding curtain and allow gravity to deploy said curtain to its window shielding position, said latch device comprising a support, a cylindrical latch finger including a root portion and a latch pin portion freely pivotably connected at one end to the root portion about a transverse pivot relative to the longitudinal axis of the latch finger, said transverse pivot carried by said root portion, said root portion rotatably journalled in said support and extending substantially horizontally, said latch pin portion retained in a substantially horizontal latching position coaxial with said root portion and overhanging from said support, when said transverse pivot is upright in a first rotated position of said root portion, and taking a downwardly hanging release position

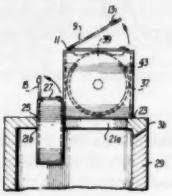
when said transverse pivot is substantially horizontal in a second rotated position of said root portion, said latch pin portion, when in said latching position, underlying a portion of said shielding curtain when in rolled-up position and constituting a stop holding said shielding curtain in said rolled-up position, said latch pin portion, when in said downwardly hanging release position, releasing said shielding curtain to deploy under gravity, means biasing said root portion to its second rotated position, a catch device releasably holding said root portion in its first rotated position, wherein said transverse pivot is upright, and a trigger device actuated by expansion of said bellows to operate said catch device to cause the latter to release said root portion and allow its rotation to its second rotated position under the action of said biasing means.

4,084,520

CURRENCY DROP SAFE

David Lee Frier, Columbia, S.C., assignor to Bankers Trust of South Carolina, Columbia, S.C.

Filed Sep. 3, 1976, Ser. No. 720,216
Int. Cl.[2] E05G *1/08*
U.S. Cl. 109—56 **3 Claims**



1. An attachment for a safe comprising a first container having side walls and defining top and bottom openings, a second container attached to one of said side walls but projecting beyond the plane of said bottom opening, said second container defining a top opening, a door for closing each of said top openings, means mounting said first container on the exterior of a safe with the bottom opening of said first container affording communication with the safe interior and with said second container projecting into the safe interior, a third container having a single opening, means mounting said third container within said first container for movement between a position in which its opening is in registry with said top opening of said first container to a position in registry with the bottom opening of said first container whereby money may be placed in the safe through said first container.

4,084,521

METHOD AND APPARATUS FOR THE PYROLYSIS OF WASTE PRODUCTS

Oskar Herbold, Meckesheim, and Dieter Dittloff, Sinsheim, both of Germany, assignors to Helma Lampl, Sinsheim-Rohrbach, Germany

Filed Oct. 23, 1975, Ser. No. 625,311
Claims priority, application Germany, May 9, 1975, 2520754
Int. Cl.[2] F23G *5/02, 5/12*
U.S. Cl. 110—242 **20 Claims**

1. A method for carrying out the pyrolysis of waste products containing hydrocarbons comprising the steps of:

disintegrating the waste products into cuttings;

drying the cuttings;

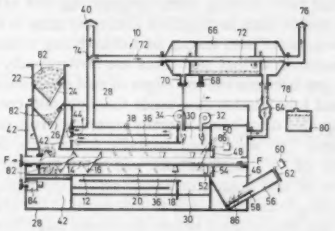
driving the dried cuttings through a reactor vessel having an entrance end and a delivery end;

heating the cuttings as they are being driven from the entrance end to the delivery end of the reactor vessel to the decomposition temperature of the cuttings, said reactor vessel being maintained at a sub-atmospheric pressure, said reactor vessel further being maintained airtight and substantially free of oxygen;

damming the cuttings at the delvery end of the reactor vessel such that the entire reactor becomes filled with the cuttings, said uttings being kept compressed at a predetermined dynamic pressure; and

passing the decomposition gases and residue of undecomposed cuttings into a delivery chamber where said gases and residue are separately removed, said delivery chamber being maintained at sub-atmospheric pressure and substantially oxygen free by the exclusion of air.

7. Apparatus for carrying out the pyrolysis of waste products containing hydrocarbons comprising a reactor vessel having an entrance end and delivery end, a driven feed device provided in the reactor vessel for driving waste products in the form of cuttings between the entrance and delivery end



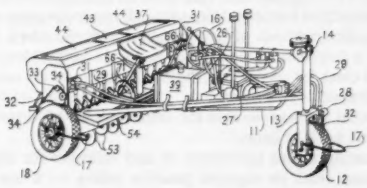
thereof, a heating device arranged coaxially around the reactor vessel for heating the waste material cuttings, a charging hopper, which is at least partially heated, being connected airtightly to the reactor vessel at its entrance end, airtight closures of the hopper being provided, a delivery chamber connecting with the reactor vessel at its delivery end for receiving the decomposed products of the waste products, means for keeping the delvery chamber airtightly closed, a delivery closure separating the delivery chamber from the reactor tube means for biassing the delivery closure to its closed position and a blower, the suction side of which is connected to the delivery chamber to remove the gaseous products and maintain both the delivery chamber and reactor vessel at sub-atmospheric pressure.

4,084,522

APPARATUS AND METHOD FOR SOWING SECOND CROP IN STANDING CROP

Lloyd Younger, 215 N. Church St., Bethany, Ill. 61914

Filed Oct. 3, 1975, Ser. No. 619,202
Int. Cl.[2] A01C *5/06*
U.S. Cl. 111—14 **2 Claims**



1. Apparatus for planting seeds between rows of growing grain comprising a frame, three wheels supporting said frame above the ground, said wheels comprising a front wheel and a pair of rear wheels, the distance measured transversly to the direction of movement of said apparatus between said front wheel and either of said rear wheels being a distance which is an even multiple of the distance "*x*" between conventionally planted rows of grain, the widths of said wheels being less than "*x*", and which futher comprises first wheel mounting means on the front of said frame for turning said front wheel relative to a vertical axis, a steering mechanism for said first wheel

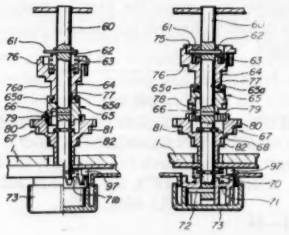
mounting means to steer said apparatus and second wheel mounting means for each of said rear wheels, a hydraulic motor for each said wheels, a prime mover on said frame, a pump driven by said prime mover, and control means for driving each of said motors from said pump, a drill on said frame having a hopper extending transversely of said frame formed on its bottom with a plurality of apertures, seed discharge means for releasing seeds from said hopper at spaced intervals through said apertures, and for each of said apertures a tube supported by and depending from said hopper receiving seeds discharged through said apertures, said second wheel mounting means being connected to the outer ends of said hopper, and planting means on the lower end of said tube for planting said planting means comprising a separate axle for each said tube, bearing means supporting said axle from said frame, pair of discs having their axes transverse to the direction of movement of said frame, said discs being rotatable on said axle mounted so that said discs are downwardly converging with a gap between the top edges of said discs, a cover for said gap, said tube discharging seeds through said cover and into said gap, said discs being laterally separated from each other by a distance "x" and offset laterally from each said wheel a multiple of "x", said hopper and all transversly extending portions of said apparatus below said hopper being elevated above the ground a distance at least equal to the height of grain which has been planted before the winter and allowed to grow until about June 1.

4,084,523

CAM SELECTING DEVICE FOR A SEWING MACHINE

Norboru Kasuga, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 711,078
Claims priority, application Japan, Aug. 11, 1975, 50-97970
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 A **19 Claims**



1. In a sewing machine wherein a drive shaft rotates relative to the machine frame in order vertically to reciprocate a needle and to rotate a pack of pattern cams, and wherein a cam follower is displaceable along said pack and engageable with each of said cams for controlling the stitch pattern of the needle, the improvement comprising:

selector means operable for displacing said follower along said pack of cams;

actuating means connected to said follower for displacing same from an engaged position riding on a one of said cams into a disengaged position clear of said cams and displaceable along said pack;

operating means including an operator element displaceable in a predetermined manner and connected to said selector means and to said actuating means for displacement of said cam follower into said disengaged position on displacement of said operator element in said manner and then displacement of said cam follower along said pack on continued displacement of said operator element in the same manner;

holding means connected to said follower for retaining same in said disengaged position after displacement of same by said actuating means through said operator element into said disengaged position; and

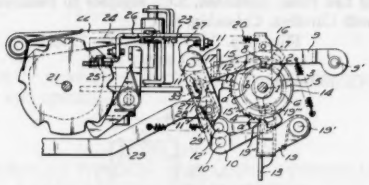
releasing means connected to said follower for displacing same from said disengaged position into said engaged position.

4,084,524

TWO-STEP BUTTONHOLE MECHANISM FOR SEWING MACHINE

Syoogo Hasegawa, Ibaragi, Japan, assignor to White Sewing Machine Company, Cleveland, Ohio

Filed Aug. 30, 1976, Ser. No. 718,808
Claims priority, application Japan, Sep. 11, 1975, 50-127557[U]
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 B **5 Claims**



1. In a sewing machine having a needle bar, a feed mechanism, an upper shaft, a device for sewing of buttonholes comprising a control shaft journaled on the frame of the machine, an amplitude cam for controlling the amplitude of lateral oscillations of the needle, a base line cam for causing lateral needle oscillation to occur left, right, or centered with respect to the center needle position and a work feed control cam for determining the direction and rate of work feed, said cams each being fixed to said control shaft, a manually engageable control knob operably connected to said control shaft and adapted to determine two positions for said control shaft, follower means associated with each of said cams and connected to said needle bar and said feed mechanism for effecting appropriate operation of said needle bar and said feed mechanism to produce a buttonhole, a ratchet wheel fixed on said control shaft, a pawl operated by said upper sheet to advance said ratchet wheel from either of said two positions, one incremental rotational step for each rotation of said upper shaft, means for limiting the number of incremental rotational steps taken by said shaft from each of said two positions, means operable by said cams for sewing each end of the buttonhole to produce relatively little or no feed movement and a large amplitude during stitches formed while said shaft is being incrementally stepped from either of said two positions, means operable by said cams for sewing each side of the buttonhole by producing a moderate feed rate at the last step of said shaft from each of said positions and during subsequent stitching, means operable by said cams to cause sewing to continue in a first direction at the right side upon reaching the last step from one of said positions and during subsequent stitches and to cause sewing to continue in an opposite direction at the left side upon reaching the last step from the other of said positions and during subsequent stitches.

4,084,525

METHOD OF FORMING A HERMETICALLY SEALED CONTAINER AND THE TOOLS USED THEREWITH

Morris A. Booth, Traverse City, Mich., assignor to Swanco, Acme, Mich.

Filed May 30, 1975, Ser. No. 582,371
Int. Cl.² B21D *51/48*
U.S. Cl. 113—1 K **19 Claims**

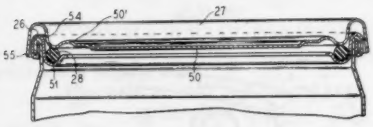
1. A method of forming a hermetically sealed container from a previously used can comprising the steps of

providing a can having a continuous side wall with a bottom

and a top attached thereto, said top having an annular portion crimped on the side wall to form a rim, an integral opening means, and an annular depression adjacent said rim, said annular depression having an inner edge spaced radially inward of the rim;

removing a portion of the top disposed radially inward of said inner edge of the annular depression to provide an opening surrounded by the annular depression;

placing a continuous sealing member in said annular depression;



assemblying a lid on the top, said lid having an annular shoulder for engaging the sealing member and an annular flange having a reversed bend, said flange extending from the shoulder over the rim and providing an annular skirt extending along an outer surface of the rim to terminate therebelow;

forcing the lid into sealing engagement with the sealing member; and

while holding the lid in sealing engagement, crimping the annular skirt radially inward beneath the rim to hold the lid in said sealing engagement.

4,084,526

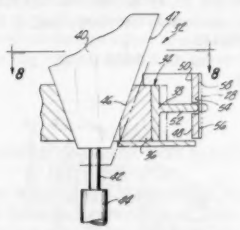
METHOD OF FORMING RINGS

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

Filed Dec. 10, 1975, Ser. No. 639,397

Int. Cl.² B21D *53/32*

U.S. Cl. 113—116 E **12 Claims**



1. The method of forming an annular ring comprising the steps of supporting a cylindrical member at marginal edge portions along the entire inner periphery at opposite sides of a selected annular portion on supporting apparatus having support members for engaging the inner periphery of the cylindrical member and defining an annular opening therebetween, the width of said opening corresponding to the width of the selected annular portion, and displacing said selected annular portion of said cylindrical member radially outwardly while maintaining the outer periphery of said cylindrical member unsupported on forming apparatus having a plurality of forming members movable radially outwardly between said support members, the selected annular portion being displaced to form a radially extending formed portion constituting a substantial portion of the annular ring and having a cross section with substantially parallel leg parts extending from immediately adjacent said support members and extending radially to a predetermined radius.

4,084,527

HOPPER BARGE BOTTOM SEAL CONSTRUCTION

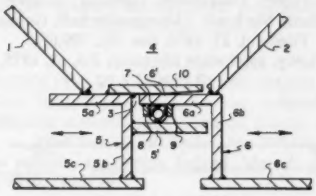
Gerhard Hellmich, Deggendorf, Germany, assignor to Deggendorfer Werft und Eisenbau G.m.b.H., Germany

Filed Jul. 8, 1976, Ser. No. 703,585

Claims priority, application Germany, Jul. 11, 1975, 2530929

Int. Cl.² B63B *35/30*

U.S. Cl. 114—36 **2 Claims**



1. A hopper barge bottom seal construction, comprising a barge having first and second pivotal parts extending longitudinally and having lower ends extending obliquely downwardly toward each other, seal means provided at the lower ends of said parts sealing the space therebetween and comprising a first support having a first top horizontal member engaged below and secured to the bottom end of the first part, a second support having a second top horizontal member alongside said first top horizontal member in a closed position and being secured to said second barge part, said first support having a lower support plate extending below said second top horizontal member and the top of said lower support plate, an elastic cylindrical hollow tubular seal body filled with gas under pressure and disposed between the bottom of said second top horizontal member and the top or said lower support plate, a locking strip secured to said first top horizontal member and projecting outwardly therefrom into locking engagement over said second top horizontal member, and a substantially vertical rib on each side of said seal body extending substantially vertically downwardly from said second top horizontal member and holding the elastic seal body in position so that said seal body projects beyond said ribs toward the opposite lower support plate.

4,084,528

WORKING METHOD OF BREAKING UP SHIP

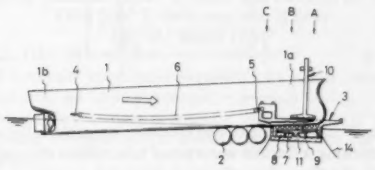
Mituo Itani, Chiba; Hiroyuki Kawashima, Yokohama; Takasuke Inoue, Kunitachi, and Mikio Maruyama, Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1977, Ser. No. 757,292

Claims priority, application Japan, Mar. 18, 1976, 51-29607; Mar. 18, 1976, 51-29613; Mar. 18, 1976, 51-29615; Mar. 18, 1976, 51-29617

Int. Cl.² B63C *1/06*

U.S. Cl. 114—45 **5 Claims**



1. A method of breaking up a ship hull said method comprising supporting a portion of said hull with bouyant means such that the stem or stern of the hull is above the water surface the other portions of the hull remaining in the water; positioning

the portion of the stem or stern above the water surface within a marine workshop; breaking up said portion of the hull positioned within the marine workshop; and drawing an additional portion of the hull into the marine workshop after said portion of the hull in the marine workshop has been broken up.

4,084,529

FLOATING DRY DOCK WITH LIFTING PONTOONS

Helmut Katernberg, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Filed Jul. 27, 1976, Ser. No. 709,073
Claims priority, application Germany, Jul. 31, 1975, 2534171
Int. Cl.[2] B63C *1/02*
U.S. Cl. 114—46 **3 Claims**

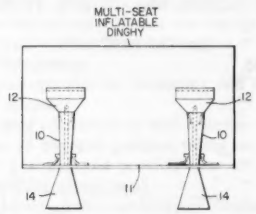
1. A floating dry dock system comprising a central unit of a floodable and drainable box having lateral walls and a bottom with transverse beams extending thereacross at spaced longitudinal locations, at least one smaller lifting pontoon on which the central unit can be placed and which has a positive buoyancy dimensioned so that said central unit can be lifted from the water, with said central unit of the dock being designed as a box dock and said lifting pontoon being adapted to engage the dock from below along the entire corss-sectional width of said central unit and having a top deck, a plurality of steel beams on said top deck defining supporting surfaces for the docked central unit, said lifting pontoon having a lateral console-like extension at at least one side, pump and drain means for flooding and emptying said pontoon, said steel beams of the deck being arranged athwartships and spaced from each other by distances corresponding to the spacing of the transverse beams of the dock and are provided with a wooden bearing surface.

4,084,530

BALING OF WATERBORNE CRAFT

Gordon Colin Harris, Bridgend, Wales; Robert Paul Vere, Cirencester, and Ronald Walker, Denton, both of England, assignors to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittannic Majesty's Government of the, London, England

Filed Jun. 3, 1976, Ser. No. 692,502
Int. Cl.[2] B63B *13/00*
U.S. Cl. 114—183 R **33 Claims**



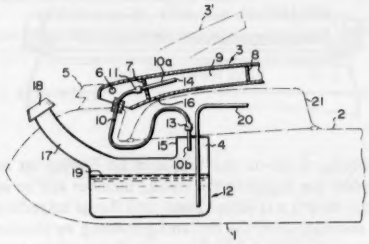
1. A craft having at least one manually operable baler assembly comprising a flexible waterproof tube within the craft and sealed to the floor thereof and at least one non-return valve arranged to permit only flow of liquid out of the craft via the tube by gravity, the tube having a funnel mouth within the craft, said tube being long enough for the funnel mouth to be raised in use above the normal level of water exterior to the craft when loaded.

4,084,531

FUEL TANK BREATHING MEANS FOR SMALL SIZE BOATS

Takashi Fujiura, Hyogo; Kunio Tsutsui, and Hiroshi Nishida, both of Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Continuation of Ser. No. 553,011, Feb. 25, 1975, abandoned.
This application Oct. 18, 1976, Ser. No. 733,312
Claims priority, application Japan, Feb. 26, 1974, 49-23553
Int. Cl.[2] B63H *2/00*
U.S. Cl. 114—211 **5 Claims**



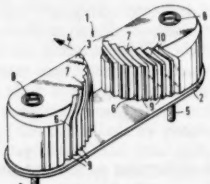
1. Fuel tank breathing means for a boat having a body equipped with an internal combustion engine, a fuel tank, and a hollow handle column pivotally mounted at one end thereof on said body of the boat, said breathing means comprising breathing conduit means having one end communicating with the fuel tank at its upper portion and the other end projecting into and opening to a chamber defined in the column outside the body of the boat, said chamber having ventilating and drain aperture means formed at a lower portion thereof.

4,084,532

LINE CLEATS FOR SECURING ROPES, BUT ESPECIALLY FOR LINES TO SAILS OF SAILBOATS

Emil Feder, Koelnische Strasse 101, 3599 Kassel, Germany

Filed Jul. 29, 1976, Ser. No. 709,721
Claims priority, application Germany, Aug. 1, 1975, 2534474; Nov. 17, 1975, 2551486
Int. Cl.[2] B63B *21/08*
U.S. Cl. 114—218 **13 Claims**



1. A cam cleat, comprising:
a base;
a cam element pivoted to said base about a pivot axis perpendicular to said base and having a first surface thereon;
means confronting said cam element on said base coacting therewith to form a line-receiving nip, said cam element being relatively displaceable in an opening direction about said pivot axis to vary the size of said nip for the accommodation of lines of different diameters;
spring means biasing said cam element and said confronting means toward each other;
first serration defining means on said first surface of said cam element extending parallel to each other in a first direction;
a second surface on said cam element extending upwardly

from said first surface and diverging at an angle therefrom to define a V-shaped entry in the latter in cooperation with said confronting means; and

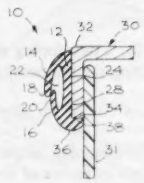
second serration defining means on said second surface means extending in a second direction upwardly from the upper end of said first serration defining means and inclined to said base so that the upper end of said second serration defining means is laterally spaced on said second surface in said opening direction from the lower end thereof.

4,084,533

REVERSIBLE RUBRAIL FOR VESSELS

Edward J. Boyer, Attleboro, Mass., assignor to Whittaker Corporation, Los Angeles, Calif.

Filed Mar. 21, 1977, Ser. No. 779,642
Int. Cl.² B63B *59/02*
U.S. Cl. 114—219 **8 Claims**



1. An improved invertible rubrail for use with vessels with overlapping decks with planar surfaces and vessels with flush decks with planar surfaces, said rubrail comprising an elongated flexible resilient strip having:

(a) an upstanding rear wall with a continuous rear surface, the length of which is adapted to lie flush with the planar surface on which is it used;

(b) spaced first and second front walls connected to said rear wall adjacent to upper and lower ends of the rear wall, said two front walls projecting forward of said rear wall, having releasably contacting overlapping openable ends and defining with said rear wall a compressible cavity accessible through said openable ends; and,

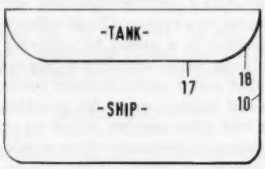
(c) an end wall connected at one of said ends of said rear wall and extending rearwardly thereof generally perpendicular thereto.

4,084,534

ROLL DAMPING TANKS FOR SHIPS AND LIKE VEHICLES

Ewan Christian Brew Corlett, Basingstoke, England, assignor to Hydroconic Limited, Ramsey, Isle of Man

Continuation-in-part of Ser. No. 564,122, Apr. 1, 1975, abandoned. This application Jun. 29, 1976, Ser. No. 700,844
Claims priority, application United Kingdom, May 28, 1974, 23689/74
Int. Cl.² B63B *39/03*
U.S. Cl. 114—125 **4 Claims**



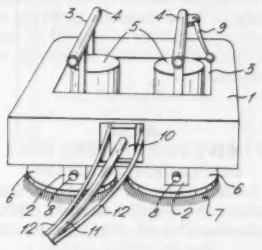
1. In a ship, a roll-damping tank to contain liquid that moves in the direction from end to end of the tank upon occurrence of the roll to be damped, said tank having a generally rectangular cross-section and ends that are contiguous with the ship's hull side walls, and wherein the tank walls are configured so that in plan the tank appears as having straight sides and continuously curved ends to which the ship's sides are tangential, the curved ends being such that consecutive points on the curved ends have tangents at different angles, and in elevation the tank appears as being generally rectangular with ends that reduce in cross-section, the upper end corners forming right angles with the top of the tank and the tank bottom having end portions that ascend progressively as the extreme ends of the tank are approached to produce said reduction in cross-section.

4,084,535

APPARATUS FOR CLEANING SUBMERGED SURFACES

Robin Gore Rees, Portmarnock, Ireland, assignor to Institute for Industrial Research and Standards, Dublin, Ireland

Filed Feb. 22, 1977, Ser. No. 770,430
Claims priority, application Ireland, Mar. 1, 1976, 409/76; Aug. 26, 1976, 1910/76
Int. Cl.² B63B *59/00*
U.S. Cl. 114—222 **2 Claims**



1. An apparatus for cleaning submerged surfaces, said apparatus comprising a frame, two rotary brushes, mounting means mounting said rotary brushes on said frame in side-by-side relation and for independent pivotal movement with respect to said frame for inclination towards or away from the other, a handle associated with each brush for manually effecting pivotal movement of each brush, and drive means connected to said brushes for rotating said brushes in opposite directions, said drive means including a separate motor for each brush, each motor having a shaft, said motors forming part of said mounting means with each brush being mounted on the shaft of its respective motor, each brush, motor and respective handle forming a brushing unit, said frame defining an aperture for said brushing units with each brushing unit being mounted for pivoting as a whole in said aperture, and each brush projecting from said aperture on one side of said frame and each handle projects from said aperture on an opposite side of said frame.

4,084,536

SAFETY CONTROL SYSTEM FOR HYDRAULIC JET TURBINES

Thomas A. Stansbury, 7237 S. Shore Dr., Chicago, Ill. 60649

Filed Nov. 7, 1973, Ser. No. 413,685
Int. Cl.² B63H *11/02*
U.S. Cl. 115—16 **3 Claims**

1. A hydraulic jet propulsion system for a vessel comprising,

a hydraulic jet turbine mounted in a vessel having a venturi section and a main propulsion opening in said venturi section through which water is ejected into the atmosphere,

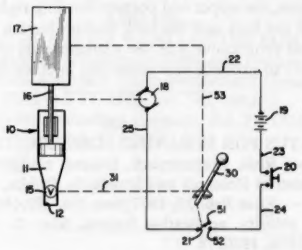
a shutoff valve closing said main propulsion opening,

manually operated control means operatively connected to said shutoff valve to close and open said valve,

an engine having a drive shaft connected to said hydraulic jet turbine to drive said turbine, said engine having an electrically energized starter,

a manually operated switch electrically connected in series with said starter,

a switch operatively connected to said manually operated control means to be closed when said shutoff valve is closing said main propulsion opening and electrically



connected in series with said starter and said manually operated switch, said control means operated switch comprising a magnet and a magnetic electrical switch, and

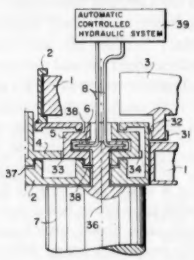
a source of electrical power connected in series with said starter, said manually operated switch and control means operated switch.

4,084,537

FLANK DRIVE FOR PLANING HULL AND DISPLACEMENT CRAFT

Horst Eichler, Aufdem Sande 12, 54 Koblenz, Germany

Continuation of Ser. No. 549,558, Mar. 17, 1975, abandoned.
This application Oct. 18, 1976, Ser. No. 733,146
Int. Cl.[2] B63H *1/10*
U.S. Cl. 115—50 **13 Claims**



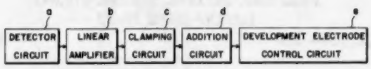
1. A flank drive for a watercraft, comprising: a wheel body mounted for rotation about an axis in said watercraft; propulsion means for rotating said wheel body about its axis; a plurality of propeller housings mounted on said wheel body in peripherally spaced relationship around said wheel body axis for rotation with said wheel body about said wheel body axis when said wheel body is driven by said propulsion means, and each of said propeller housings being rotatably mounted with respect to said wheel body about respective propeller housing axes so that each propeller housing axis follows a stationary sinuating line as the watercraft moves rectilinarilly through the water with rotation of said wheel body; normally stationary reaction means drivingly coupled with said propeller housings so that said propeller housings undergo epicyclic motion when said wheel body is driven by said propulsion means; a propeller drivingly carried by each of said propeller housings, respectively, to extend from said watercraft into the water during movement of said watercraft through the water; each of said propellers being mounted for limited pivotal movement relative to its housing; angle of attack control means for controlling the pivoting of each of said propellers relative to its propeller housing for positioning each propeller blade at an effective angle of attack relative to said sinuating line, over at least a major portion of said sinuating line, so as to exert forces on the surrounding water transverse to the driving direction of said watercraft for propulsion of the watercraft.

4,084,538

AMBIENT TEMPERATURE COMPENSATING DEVICE FOR POWER SOURCE APPARATUS FOR DEVELOPING ELECTRODES

Masaaki Tanaka, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England

Filed Jan. 3, 1977, Ser. No. 756,524
Claims priority, application Japan, Feb. 9, 1976, 51-12213
Int. Cl.[2] G03G *15/06*
U.S. Cl. 118—4 **4 Claims**



1. A power source for a developing electrode comprising:

a detector for detecting the temperature of a photosensitive body;

a linear amplification circuit for amplifying signals of the detector,

a clamping circuit for clamping output voltages of the linear amplification circuit in excess of normal temperature;

an addition circuit for permitting the output voltages of the linear amplification circuit to move in parallel within a range of ambient temperatures; and

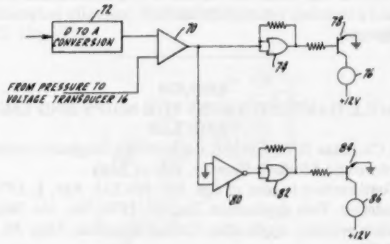
means for supplying the output of the addition circuit to the developing electrode.

4,084,539

VOLTAGE TO AIR PRESSURE TRANSDUCER

Robert W. Schmidt, Oak Lawn, Ill., assignor to Copar Corporation, Oak Lawn, Ill.

Filed Sep. 24, 1976, Ser. No. 726,451
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—8 **3 Claims**



1. A means for controlling the pressure of liquid adhesive in response to movement of the article to which the adhesive is to be applied, including a pressure regulating valve, the input of which is connected to a source of liquid adhesive, the output of which is connected to a means for applying adhesive, said pressure regulating valve including a passage between said input and output and a valve member controlling adhesive flow through said passage, means for providing a variable air pressure upon said valve member, which air pressure varies in response to changes in movement of the article to which adhesive is to be applied,

said means for providing a variable air pressure including an air pressure reservoir, a pressure-to-voltage transducer connected at the output of said reservoir, and electrically controlled air pressure supply valve and an electrically controlled exhaust valve connected to said reservoir,

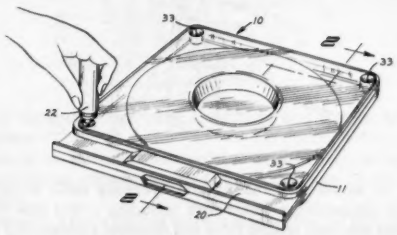
means for providing an electrical signal representative of movement of the article to which adhesive is to be applied, comparison means for poviding a signal representing the difference between said electrical signal and the output from said transducer, and means connecting and utilizing said difference signal to control said supply valve and exhaust valve.

4,084,540

APPARATUS FOR APPLYING LUBRICATING AND PROTECTIVE FILM TO PHONOGRAPH RECORDS

Bruce R. Maier, Columbia, Mo., assignor to Discwasher, Inc., Columbia, Mo.

Filed May 19, 1977, Ser. No. 798,382
Int. Cl.[2] C23C *13/08*
U.S. Cl. 118—48 **18 Claims**



8. Apparatus for applying a protective film to the face of a disc type phonograph record from a gaseous source of such film material, comprising

a broad and generally flat housing having top, bottom and side walls defining an interior chamber to entirely enclose such a phonograph record and isolate the environment in the chamber from the atmosphere at the exterior of the housing, the interior chamber and side walls having a height which is significantly less than the length and width of the top and bottom walls, the housing being provided with the means for obtaining access into the chamber for inserting and removing such a phonograph record, the housing having gas flow receiving port means directing the inflowing film material in gaseous form in a direction generally between and substantially parallel to the top and bottom of the housing to facilitate substantially uniform deposition of the film material on the phonograph record, said port means including a plurality of stationary nozzles disposed spacedly about the periphery of the housing, and each nozzle having an inlet socket through which the gaseous film material delivery means is received and an outlet orifice directed between and substantially parallel to the top and bottom of the housing.

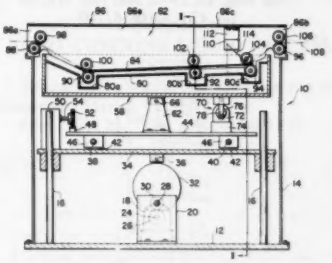
4,084,541

DYEING AND DECOLORIZATION APPARATUS FOR USE IN A BLOOD SERUM ANALYZER OF AN ELECTROPHORETIC TYPE

Hiromi Ito, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 20, 1976, Ser. No. 678,712
Claims priority, application Japan, Apr. 22, 1975, 50-48135; Dec. 8, 1975, 50-146168; Jan. 17, 1976, 51-4512; Jan. 17, 1976, 51-4513
Int. Cl.[2] B05C *3/00*
U.S. Cl. 118—421 **10 Claims**

1. An apparatus for dyeing and decolorizing a predetermined length of a specimen carrier having a front and rear end of a belt-like shape, carrying a plurality of specimens such as blood serums which have been treated by an electrophoretic apparatus comprising a carrier transport mechanism for receiving and holding the specimen carrier therein during dyeing and decolorization processes for the specimen carrier and for transporting the specimen carrier out of the dyeing and decolorization apparatus after the completion of said processes, a dyeing trough containing a dyeing liquid agent and supported movably with respect to the carrier transport mechanism, a decolorization trough containing a decolorization liquid agent and supported movably with respect to the carrier transport mechanism, a first drive means for moving said dyeing and decolorization troughs in a vertical direction and a second drive means for moving said dyeing and decolorization troughs in a horizontal direction, said carrier transport mechanism comprising a drum having a center shaft, a pair of support plates rotatably mounted on said shaft at a position adjacent both side walls of the drum so that said drum lies therebetween, two pairs of rollers rotatably supported between the support plates with the pairs being spaced apart a given distance along the periphery



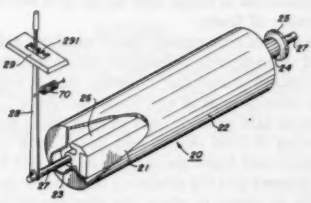
of the drum, said distance being less than the length of the specimen carrier so that the peripheries of each roller engage the periphery of the drum, a third drive means for rotating only the drum and a fourth drive means for rotating the drum and the support plates together so that after said third drive means rotates said drum so that the specimen carrier is fed onto the carrier transport mechanism with both ends held between said two pairs of rollers and said drum, said drum and said plates are rotated together by said fourth drive means only until the specimen carrier is positioned so that the longitudinal center of the specimen carrier is at its lower most position in a treating position thereby allowing thorough treatment in each of said dyeing and decolorization troughs when they are subsequently moved into treating positions with respect to the specimen carrier.

4,084,542

POSITIONING APPARATUS FOR MAGNETIC BRUSH DEVELOPING DEVICE

Ryuzo Okada, and Yoshikazu Okamoto, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Jun. 7, 1977, Ser. No. 804,217
Claims priority, application Japan, Jun. 16, 1976, 51-069746
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—658 **1 Claim**



1. An improved magnetic brush developing device for developing an electrostatic latent image on a photosensitive member disposed adjacent to the device, the device including a magnet and a cylinder mounted to rotate around the magnet

to bring developer into contact with the photosensitive member, the improvement comprising:

means for rotating the magnet to and fixedly holding the magnet in any one of a plurality of predetermined positions relative to the photosensitive member, the rotating and holding means including means having a plurality of grooves formed therein, each of the grooves defining one of the predetermined positions, a handle mounted for movement between the grooves, and means for holding the handle in any one of the grooves.

4,084,543

AQUATIC BIOTAL MONITOR

Willis E. Pequegnat, College Station, Tex., assignor to TerEco Corporation, College Station, Tex.

Filed Aug. 25, 1976, Ser. No. 717,701
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—3 **6 Claims**

1. A biological monitoring device for monitoring in situ samples of biota in a body of water comprising:

a top hexagonally shaped mounting ring defining an opening;

a bottom hexagonally shaped mounting ring;

a water permeable mesh extending between and interconnected to said mounting rings to form an open-topped cylindrical enclosure, said mesh having apertures therethrough with dimensions for retaining the biotal samples while permitting the free exchange of ambient water from exterior of said enclosure to within said enclosure, thereby uniformly exposing the samples of biota to aquatic pollution found within the body of water;

a receptacle for collecting material from within said cylindrical enclosure comprising a conical funnel being open at its ends and decreasing in cross-sectional area from one end to the other, the larger end thereof being secured to said cylindrical enclosure and opening thereinto and the smaller end thereof being removably secured to a collection enclosure and opening thereinto for retaining material therein which has fallen to the bottom of said cylindrical enclosure, said collection enclosure being cylindrical in shape with an integral bottom;

a plurality of floats;

a plurality of rectangular frame members extending across said open-topped cylindrical enclosure and being interconnected to said top mounting ring at points interior of the exterior ends of said frame members;

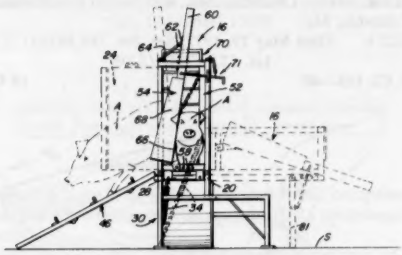
means on said exterior ends of said frame members for receiving at least one of said floats, such that said floats support said frame members to permit said frame members to suspend said top mounting ring above the surface of the body of water to allow the free circulation of ambient water throughout the entire length of said cylindrical enclosure between said mounting rings, thereby uniformly exposing the biotal sample to the ambient water outside said enclosure and to suspend said enclosure in the body of water to permit the biological monitor to freely drift with extant currents to monitor the impact of changing aquatic environments on the biotal sample.

4,084,544

HOLDER AND OPERATING TABLE FOR SWINE AND OTHER ANIMALS

Richard L. Wehmeyer, R.F.D. No. 1, Creighton, Mo. 64739

Filed Oct. 22, 1976, Ser. No. 735,066
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—103 **1 Claim**

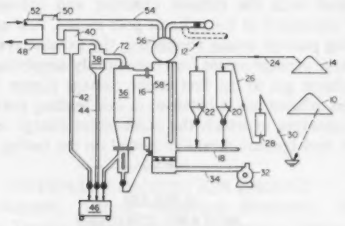


1. In an animal handling and operating table including a chute comprising a framework including a first side wall, a second side wall spaced from and disposed substantially parallel to the first side wall, and a floor affixed to the first side wall, and a head gate affixed to the first side wall and disposed for selectively restraining an animal between the first side wall and second side wall, the first side wall being pivotally mounted for vertical swinging movement upwardly and downwardly and forming an operating table when in a downward position, and the second side wall having a portion adjacent the head gate being pivoted for forming a side gate permitting an animal to exit following an operation thereon, the improvement wherein the first side wall is a floating table provided with means for biasing the wall against a downward swing for preventing a sudden drop of the first side wall when an animal is retained on the first side wall, and for assisting an operator in swinging the first side wall upwardly and downwardly, the floor being a solid sheet and disposed extending perpendicularly from the first side wall at the axis of swinging of the first side wall, and a stand supporting the framework on the chute, an on-ramp extending from the level of the support surface on which the stand is resting to the chute for permitting animals to ascend from the chute, the floor forming a solid bottom for the chute when the first side wall is in an upward position, and an off-ramp extending from the support surface to the side gate of the second side wall for permitting an animal to descend from the chute, the means for biasing including two tension springs normally disposed beneath the chute, each attached to and arranged extending between the stand from adjacent the support surface and a substantially common point on the floor of the first side wall, the substantially common point being spaced from the first side wall and the springs diverging from one another from the substantially common point on the floor toward the stand for exerting a torque on the first side wall, the head gate comprising a head frame disposed at a head end of the chute and attached to the first side wall for movement therewith, a head stock pivotally mounted at an adjustable pivot on the head frame, a retaining arm extending from the head stock and provided with a plurality of teeth, and a lock arm pivotally mounted on the framework of the chute for selectively engaging one of the teeth of the retaining arm and preventing the head stock from moving away from a position restraining an animal in the head gate, and animal retaining means including a flexible element removably attachable to the first side wall about an animal for holding the animal against the first side wall.

4,084,545
OPERATING METHOD

Herman Nack, Upper Arlington, and Ke-Tien Liu, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Continuation of Ser. No. 624,542, Oct. 21, 1975. This application Jun. 6, 1977, Ser. No. 803,831
Int. Cl.[2] F22B *1/02;* F23D *1/00*
U.S. Cl. 122—4 D 51 Claims



1. A method of operating a fluidized bed system, which comprises

forming an entrained fluidized bed in a first space region containing a first relatively fine solid bed particle component,

forming in a more limited space region within the first region a dense fluidized bed containing a second relatively coarse solid bed particle component essentially comprising a material having long-term physical and chemical stability in the fluidized bed system so as to be substantially non-agglomerating and not subject to substantial attrition therein,

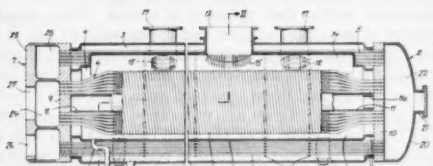
providing a recirculation path for the first particle component from the first space region through the dense fluidized bed in the more limited space region, and

operating the fluidized bed system at a velocity such that the second component particles are effectively retained in a fluidized state in the dense fluidized bed in the more limited space region, whereas the first component particles recirculate and interpenetrate therethrough, co-mingling with the second component particles.

4,084,546
HEAT EXCHANGER

Martin Schneeberger, Wolfratshausen, and Dieter Wittmann, Geretsried, both of Germany, assignors to Linde AG, Wiesbaden, Germany

Filed Sep. 3, 1976, Ser. No. 720,427
Claims priority, application Germany, Sep. 4, 1975, 2539440
Int. Cl.[2] F22B *1/16;* F28D *7/10;* F28F *9/22*
U.S. Cl. 122—32 7 Claims



1. A heat exchanger comprising:

at least two cylindrical shells in nested relation defining an outer annular compartment and an inner annular compartment;

means for passing at least one first heat exchange fluid through said compartments;

a straight-tube bundle extending through one of said compartments;

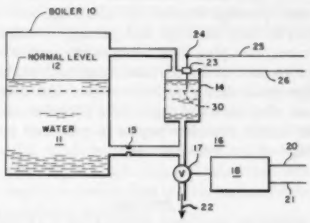
a coiled-tube bundle received within said inner compartment; and

means for passing at least one second heat exchange fluid through said tube bundles, said tube bundles having flow cross sections connected in series with said second fluid passing through said coiled-tube bundle in a direction opposite the direction of flow of said second fluid through said straight-tube bundle, said annular compartments being sealed from one another, said means for passing at least one first fluid through said compartments including a respective inlet and outlet for each compartment, said inner compartment including means forming an inlet chamber extending substantially the full length of said inner compartment.

4,084,547
SAFE START CHECKING LIQUID PROCESSING SYSTEM

Frederick T. Deziel, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 24, 1976, Ser. No. 669,777
Int. Cl.[2] F22B *37/42*
U.S. Cl. 122—504 12 Claims



1. A liquid processing system which verifies the proper condition of the system prior to the initiation of the processing of a liquid, including: liquid level sensing means having at least two contact means; a first of said contact means being open circuited upon the indication of said liquid being at a level at which said processing is desired to be initiated and close circuited upon an indication of said liquid being below said level; a second of said contact means being close circuited with said liquid indicated as at said level and open circuited with said liquid indicated as below said level; switching means energized by said first contact means being close circuited to indicate said liquid is below said level; said switching means latching itself into said energized state upon once being energized; and said switching means further including control circuit means in electrical series with said second contact means to complete an energizing circuit to initiate the processing of the liquid upon said liquid being at said level after the operation of said switching means.

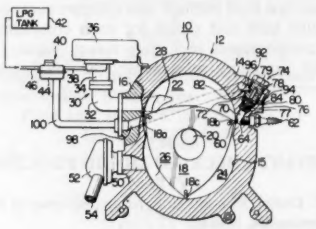
4,084,548
ROTARY PISTON ENGINE

Hachiro Sasakura, Inuyama, and Hitoshi Kanmura, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 15, 1976, Ser. No. 696,367
Claims priority, application Japan, Jun. 25, 1975, 50-90377[U]; Mar. 12, 1976, 51-30557[U]
Int. Cl.[2] F02B *53/12*
U.S. Cl. 123—205 9 Claims

1. An improved rotary piston engine comprising a housing defining a cavity therein, a rotor disposed in said cavity for planetary motion therein, said housing and said rotor cooperating to define therebetween a plurality of working chambers, the planetary rotary motion of said rotor causing each of said

working chambers to sequentially act as intake compression, combustion-expansion and exhaust chambers, said rotor having three apexes with adjacent apexes defining, respectively, the leading and trailing edges of each of said working chambers, an intake port formed in said housing and so positioned as to be open to said intake chamber, means for supplying a mixture of air and fuel through said intake port into the intake chamber, a plug hole formed in said housing and so positioned as to be opened to a working chamber, an ignition plug having a set of electrodes disposed in said plug hole to ignite the air-fuel



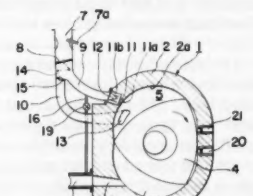
mixture in said intake chamber, said engine including a passage means for introducing a scavenging gaseous fluid through said plug hole into said intake chamber, check valve means disposed in said passage means for allowing said scavenging gaseous fluid to flow through said passage means toward said intake chamber, said plug hole being positioned in said housing with respect to said intake port such that said intake chamber's leading edge passes said plug hole to establish communication between said plug hole and said intake chamber as said trailing edge of said intake chamber begins to pass said intake port in the final stage of the intake stroke.

4,084,549

ROTARY PISTON ENGINE EXHAUST GAS RECYCLING MEANS

Haruhiko Satow, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Filed Mar. 19, 1976, Ser. No. 668,513
Claims priority, application Japan, Apr. 3, 1975, 50-40636
Int. Cl.² F02B *53/10*
U.S. Cl. 123—217 **10 Claims**



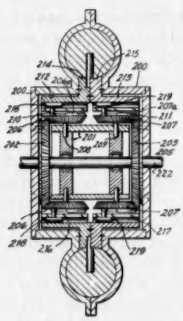
1. A rotary piston engine comprising a casing which includes a peripheral wall having an epitrochiodal inner surface and a pair of side walls secured to the opposite sides of the peripheral wall to define therein a cavity, a three-lobed rotor which rotates eccentrically in the cavity and has apex portions in sliding contact with the epitrochiodal inner surface for simultaneously defining intake, compression, combustion, expansion and exhaust chambers between the epitrochiodal inner surface and flanks of the rotor, first intake port means provided in the casing and directed into said intake chamber toward the leading, with respect to the direction of rotation of said rotor, portion of the intake chamber, first intake passage means connected to the first intake port means for supplying a combustion charge to the intake chamber, second intake port means provided in the casing and communicated with the intake chamber, second intake passage means connected to the second intake port means, said first intake port means being provided in the peripheral wall of said casing and having a smaller opening than that of the second intake port means for tending to cause the combustion charge to be present in the leading portion of the intake chamber, throttle valve means provided in the second intake passage means and adapted to be opened under a high load operation of the engine, an exhaust system including exhaust port means provided in the casing and communicated with the exhaust chamber and exhaust passage means connected to the exhaust port means, first exhaust gas recycling passage means connecting the exhaust system to the first intake passage means for continuously supplying the recycled exhaust gas to the first intake passage means so that the recycled exhaust gas is obtained in said leading portion of the intake chamber in which the combustion charge tends to be present, and ignition means provided on the casing.

4,084,550

ROTARY ENGINES

Peter Gaspar, 1567 Parker Ave., Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 375,706, Jul. 2, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,512
Int. Cl.² F02B *55/14*; F01C *1/00*; F04C *17/00*
U.S. Cl. 123—245 **17 Claims**



1. An apparatus having a main rotary axis, said apparatus including a hollow casing so shaped that parts of its surfaces define within them a substantial part of a hollow toroidal piston cylinder whose central axis is the main rotary axis of the apparatus, and two rotatable piston carriers which have generally circular rim portions and which are concentric with the hollow toroidal piston cylinder at the main rotary axis and form portions of said cylinder's enclosing surfaces, each of those piston carriers mounting along its periphery a pair of diametrically opposite pistons, which fit within the said cylinder, with pistons of the two pairs alternating in circumferential occurrence within that cylinder, a central rotary member mounted at least indirectly on said casing with its axis at the main rotary axis, drum structure carried by said central rotary member for rotation therewith, at least one traveling bevel gear carried by said drum structure, with each such traveling bevel gear having its own axis of rotation angled significantly away from parallelism with the main rotary axis, at least one fixed bevel gear fixedly mounted in relation to the casing and coaxial with the main rotary axis, each traveling bevel gear being so mounted on the drum that it meshes with the fixed bevel gear, each fixed bevel gear having twice the pitch diameter and number of teeth of each traveling bevel gear, such that when the central rotary member rotates, each traveling bevel gear rolls around the fixed bevel gears it meshes with and in the course of doing so rotates twice about its own axis, each such traveling bevel gear being linked eccentrically of itself to a piston carrier to connect that piston carrier to that traveling

bevel gear and cause the traveling bevel gear's eccentric linkage point and the piston carrier to travel rotatively about the main axis in unison at a rate that has one component from the rotation of the central rotary member and another component from the rotary excursions of the eccentric point around the axis of its traveling bevel gear whereby as the central rotary member makes one rotation a piston carrier makes two rotations with four strokes superimposed thereon.

4,084,551

INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

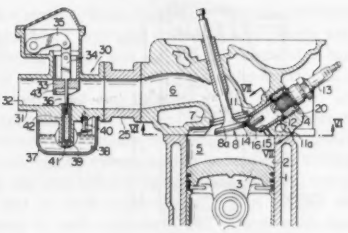
Continuation-in-part of Ser. No. 434,216, Jan. 17, 1974, Pat. No. 3,974,818. This application Sep. 5, 1975, Ser. No. 610,889

Claims priority, application Japan, Jan. 22, 1973, 48-9748; Feb. 27, 1973, 48-23919; Mar. 8, 1973, 48-27277; Apr. 3, 1977, 52-38467; Oct. 31, 1973, 48-123227; Jan. 10, 1975, 50-5750

The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.² F02B *19/10, 19/16*

U.S. Cl. 123—32 SP **20 Claims**



1. An internal combustion engine comprising:

a cylinder;

a piston in said cylinder;

a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber;

an intake valve having a valve stem and a valve head connected thereto;

an intake port for supplying an air-fuel mixture;

a trap chamber disposed in said cylinder head for receiving a portion of said air-fuel mixture to produce a torch jet ignition;

said trap chamber having at least one suction aperture through which said portion of said air-fuel mixture is supplied into said trap chamber only when said intake valve is opened and said main combustion chamber is communicated with said intake port, said trap chamber also having at least one discharge aperture through which residual gas remaining in said trap chamber is discharged into said main combustion chamber;

said suction and discharge apertures being small enough to achieve the torch jet ignition and always being in communication with said main combustion chamber during the time when said intake valve is kept closed so that the torch jet can spurt through both of said apertures; and

a spark plug having a set of electrodes for igniting said air-fuel mixture in said trap chamber.

4,084,552

METHOD AND APPARATUS FOR FUEL INJECTION CONTROL

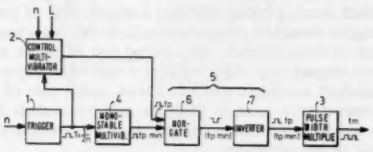
Ulrich Drews, Vaihingen-Pulverdingen; Peter Werner, Stuttgart, and Lothar Winkelmann, Ludwigsburg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 6, 1976, Ser. No. 702,929

Claims priority, application Germany, Jul. 8, 1975, 2530308

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EA **10 Claims**



1. A method for defining the minimum duration of fuel injection control pulses in a fuel injection system for an internal combustion engine comprising the steps of:

generating a trigger signal proportional to the rotational speed of the engine;

feeding said trigger signal to a first monostable multivibrator for generating minimum length control pulses;

feeding said trigger signal to a control multivibrator for generating preliminary fuel control pulses, in dependence on engine load and speed (rpm);

feeding said preliminary control pulses and said minimum length pulses to a logical circuit which chooses from these pulses those having the longer duration;

and feeding the output pulses from said logical circuit to a pulse width modulator circuit within the fuel injection system; whereby the delivery of fuel to said internal combustion engine is controlled by the pulses from said pulse width modulator circuit.

4,084,553

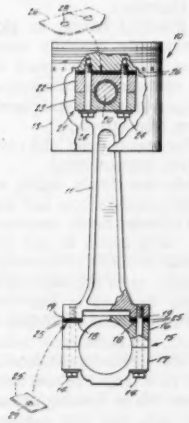
PISTON AND ROD ASSEMBLY WITH DISPLACEMENT FEATURES

Louis Forde, and Diane Forde, both of 482 Berriman St., Brooklyn, N.Y. 11208

Continuation-in-part of Ser. No. 569,090, Apr. 17, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,779

Int. Cl.² F02B *75/04;* **F15B** *15/24*

U.S. Cl. 123—48 B **1 Claim**



1. A piston and rod assembly including compression adjustment shims comprising a piston having a crown and skirt

depending therefrom, a pin supported at its opposite ends by said piston, the support at each end comprising a separate pair of directly abutting bearing blocks with a hole therethrough for supporting the respective pin end, a plurality of shims between the uppermost bearing block and the crown, and a pair of screws extending through said bearing blocks and shims and threadingly engaged in said crown, a piston rod at one end thereof having means fitted onto said pin and at the other end of said rod defining a pair of spaced feet members, a crankshaft bearing assembly comprising a pair of directly abutting bearing blocks defining a crankshaft opening therethrough, the upper crankshaft bearing block defining a spaced pair of generally right angled shoulders defined by walls supporting a respective plurality of shims therein, said spaced pair of piston rod feet members respectively engaging both a wall of said spaced pair of crankshaft shoulders and said shims, and a pair of screws each respectively passing through said crankshaft bearing blocks and shims and threadingly engaging a respective one of said pair of feet members.

4,084,554

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

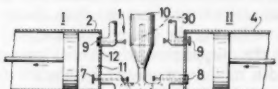
Horst Böhnlein, Friedhofstrasse 4, 6651 Altenkirchenuber Waldmohr, Germany

Filed Oct. 21, 1974, Ser. No. 516,734

Claims priority, application Germany, Apr. 11, 1974, 2417679; Sep. 5, 1974, 2442448

Int. Cl.[2] F02B *75/18*

U.S. Cl. 123—52 MF **4 Claims**



1. A multi-cylinder internal combustion engine, some of the cylinders operating in cycle phases displaced relative to each other, comprising

a plurality of cylinders each having a cylinder head and an inlet valve and an outlet valve, said plurality of cylinders constituting at least two cylinder units,

one common carburettor means for feeding an air-fuel mixture to all of said plurality of cylinders and centrally disposed relative thereto,

a common intake manifold having an elongated central portion communicatingly centrally connected to said carburettor means, and said common intake manifold having branched end portions communicating with said elongated central portion and to said plurality of cylinders at said inlet valves, respectively,

cam control means for opening said inlet valves after closing of said outlet valves, respectively,

means for operatively completely sealing said inlet valves and said respective cylinders from said intake manifold at inlet sides of said cylinder heads, respectively,

at least two check valve means in said elongated central portion of said intake manifold operatively coordinated to each of said cylinder units, respectively, said two check valve means being disposed in said elongated central portion of said common intake manifold adjacent to and on opposite sides of said carburettor means, respectively,

one of said check valve means for automatically opening by means of suction from a first of and said cylinder units coordinated thereto via an opening of said inlet valve of said first cylinder unit, and with another of said check valve means for automatically simultaneously closing when said inlet valve of a coordinated second of said cylinder units operatively with phase displaced cycle relative to that of said first cylinder unit is closed, said one and said another of said check valve means reversing in operation is reversed cycle phases respectively of the coordinated cylinder units and inlet valves, and

said carburettor means including a nozzle forming a nozzle opening having a bottom fuel outlet, and a carburettor nozzle pin means operatively connected to an accelerator pedal and said nozzle pin means being formed conically on a lower end thereof adjustably axially moveably cooperatively positioned and guided in said nozzle opening for regulating said fuel outlet of said nozzle opening, said nozzle opening and said lower end of said nozzle pin means are cooperatively formed such that at full load, and at each adjustment position of said nozzle pin means relative to said nozzle opening, respectively, the correct air-fuel mixture for the stoichiometrical equilibrium is provided, thereby for providing correct dosed fuel admission into said manifold for stoichiometric equilibrium at each adjustable position.

4,084,555

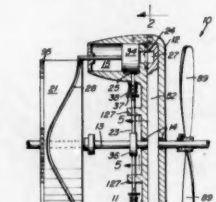
RADIAL ENGINE

Homer G. Outlaw, 1824 Nie Pkwy., New Orleans, La. 70114

Filed Jun. 18, 1976, Ser. No. 697,531

Int. Cl.[2] F02B *75/26*

U.S. Cl. 123—58 AA **8 Claims**

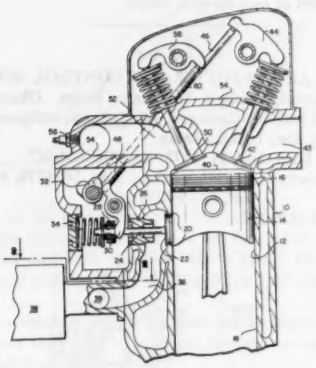


1. An internal combustion engine comprising; an engine block having at least one combustion chamber therein, means for inducting an air/fuel mixture into the engine block combustion chamber, means for igniting said mixture therein, and means for exhausting the combustion produsts thereof, a drive shaft, a rotator affixed to said drive shaft, additional means for increasing the compression of the fuel/air mixture within said combustion chamber, further means for sealing the space between the combustion chamber within the engine block and the rotator as it passes adjacent the combustion chamber, the additional means including a piston cylinder connecting with the combustion chamber in the engine block, and a reciprocating piston contained within the piston cylinder functions to increase the compression thereof, actuating means connected to said piston for effecting said increase in compression at least twice for each revolution of the drive shaft, the actuating means including a drum cam having a specially configured cam slot on the outer surface thereof in order to effect the aforesaid function, with a cam follower connected between the piston and the cam slot, the further means consists of an oval shaped compression ring mounted in an oval shaped recess in the engine block, the compression ring having a tapering concave surface facing inwardly towards the combustion chamber and a smooth flat outer face which engages with the rotator, so that an increase in compression within the combustion chamber will increase the sealing action of the compression ring.

4,084,556
INTERNAL COMBUSTION ENGINE

Tony R. Villella, 2030 N. Black Canyon, Phoenix, Ariz. 85009

Filed May 14, 1976, Ser. No. 686,264
Int. Cl.[2] F02B *75/02*
U.S. Cl. 123—75 B 9 Claims

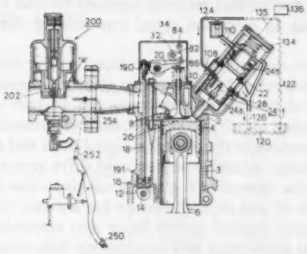


1. In a multi cylinder four cycle internal combustion engine; an engine block provided with cylinders therein; said cylinders each having a head end and a crank case end; a cam operated exhaust valve communicating with the interior of each cylinder at said head end thereof; a cam operated intake valve communicating with the interior of each cylinder at said head end thereof; an auxiliary intake manifold communicating with all of said intake valves; said cylinders each having an intake port in the sides thereof; said intake port being spaced from the head end of each respective cylinder; pistons reciprocably moveable in said cylinders; said pistons each having a top surface facing toward said head end of a respective cylinder; each top surface of each piston being moveable in each cylinder to a position between a respective intake port and a respective crank case end of the respective cylinder; air fuel mixture delivery means communicating with each of said ports whereby movement of each piston, toward said crank case end of a respective cylinder, creates a partial vacuum in a respective cylinder and in communication with the interior of said auxilliary intake manifold, when a respective one of said intake valves is open; and whereby said partial vacuum also admits an air fuel mixture to flow into said cylinder through said respective port from said air fuel mixture delivery means and whereby the next subsequent movement of said piston toward said head end of said cylinder compresses said mixture in said cylinder and thereby forces a surplus portion of said last mentioned mixture into said auxilliary intake manifold before said intake valve closes; whereupon the remainder of said mixture in said cylinder after said intake valve closes may be compressed by further movement of said piston, toward the head end of said cylinder, preparatory to the firing of said compressed remainder of said mixture in said cylinder when said piston is in the general area of its top dead center position depending upon the desired ignition location; said auxiliary intake manifold is enclosed and communicates only with said intake valves such that substantial flow from a respective one of said cylinders into said auxilliary intake manifold and from said auxilliary intake manifold into said cylinder can only occur through a respective intake valve when open.

4,084,557
PISTON-TYPE INTERNAL COMBUSTION ENGINE

David Luria, 81B University St., Tel Aviv, Israel

Filed May 6, 1976, Ser. No. 683,704
Claims priority, application Israel, Jul. 24, 1975, 47787
Int. Cl.[2] F01L *1/34*
U.S. Cl. 123—90.15 12 Claims

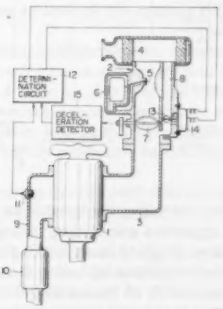


1. An internal combustion engine including a cylinder, a piston displaceable therein, a control member movable to control the engine output, means including an intake valve for effecting the induction of a fuel-air mixture into the cylinder, timing means including a main cam shaft having a cam for opening and closing the intake valve, and phase-shifting means including an auxiliary cam shaft having a cam shifting the phase of closing of the intake valve in response to the movement of the control member to thereby control the quantity of fuel-air mixture in the cylinder at the time of combustion.

4,084,558
AIR-TO-FUEL RATIO CONTROLLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Tadashi Hattori, Okazaki, and Takamichi Nakase, Gamagori, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 24, 1976, Ser. No. 660,976
Claims priority, application Japan, Feb. 27, 1975, 50-24585
Int. Cl.[2] G01N *3/00;* F02M *23/04*
U.S. Cl. 123—97 B 6 Claims



1. An air-to-fuel ratio controlling system for an internal combustion engine comprising;

a carburetor connected to an intake pipe of the internal combustion engine for supplying air-fuel mixture to said engine,

said carburetor including a first passage through which the air-fuel mixture is passed and a throttle valve for controlling the amount of said air-fuel mixture passing therethrough,

a second passage for introducing additional air into said intake pipe,

a control valve mounted in said second passage for control-

ling the amount of additional air passing therethrough to compensate for the air-to-fuel ratio of said air-fuel mixture,

a drive motor coupled to said control valve for driving the same,

air-to-fuel ratio sensing means mounted in an exhaust gas system of said engine for detecting the change in the composition of the exhaust gas to determine an air-to-fuel ratio of the air-fuel mixture supplied to said engine for producing an electrical signal representing the detected ratio,

deceleration detecting means for detecting the deceleration of said engine and producing an electrical signal, and

an electrical control circuit connected to said air-to-fuel ratio sensing means and said deceleration detecting means and responsive to the electrical signal from said air-to-fuel ratio sensing means to actuate said drive motor for controlling the amount of the additional air so that the air-to-fuel ratio of said air-fuel mixture has a preset value,

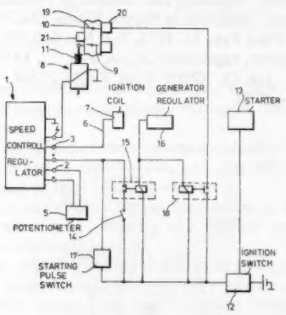
said electrical control circuit being also responsive to the electrical signal from said deceleration detecting means to stop said drive motor for a predetermined period after the start of the deceleration of said engine, independently of the electrical signal from said air-to-fuel ratio sensing means for interrupting the operation of said control valve.

4,084,559

SPEED CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Hellmut Wallbaum, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany

Filed Oct. 14, 1976, Ser. No. 732,458
Claims priority, application Germany, Oct. 15, 1975, 2546076
Int. Cl.[2] F02D *11/10*
U.S. Cl. 123—102 **6 Claims**



1. Apparatus for controlling the speed of an internal combustion engine, said apparatus comprising, in combination:

a. a throttle valve arranged in an intake pipe of the engine;

b. a speed control regulator including means for producing signals representative of the actual value and the desired value of engine speed, and comparator means, connected to said signal producing means, for producing a signal representative of the difference between the actual and desired speed values;

c. throttle adjusting means, in constant mechanical connection with said throttle valve and connected to said speed control regulator, for actuating said throttle valve in dependence upon said difference signal during non-idling operation of the engine;

d. means, connected to said throttle valve, for moving said throttle valve into its idling position when the voltage supply to the speed control regulator is interrupted; and

e. means for supplying a voltage to aid speed control regulator comprising:

(1) a voltage source;

(2) first switch means, connected between said voltage source and said speed control regulator, for interrupting the voltage supply to said speed control regulator when the engine speed is below a minimum speed, said minimum speed being below the normal idling speed of the engine; and

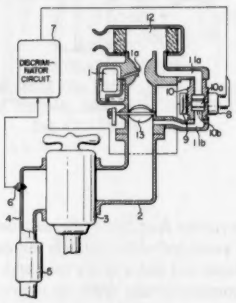
(3) pulse switch means, connected in parallel with said first switch means, for supplying a voltage pulse to said speed control regulator determinative of the starting position of said throttle valve.

4,084,560

ENGINE AIR-TO-FUEL RATIO CONTROL SYSTEM

Tadashi Hattori, Nishio; Toshiharu Iwata, Okazaki, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 21, 1975, Ser. No. 606,587
Claims priority, application Japan, Aug. 24, 1974, 49-97287
Int. Cl.[2] F02M *23/04*
U.S. Cl. 123—119 EC **6 Claims**



1. An air-to-fuel ratio control system for an internal combustion engine comprising:

a carburetor connected to an intake pipe of an internal combustion engine for supplying air-fuel mixture to said engine;

said carburetor including:

a main passage provided with a throttle valve for controlling the amount of the air-fuel mixture, and

a bypass passage provided with a bypass valve for compensating air-to-fuel ratio of the air-fuel mixture by controlling the amount of air flowing therethrough;

an air-to-fuel ratio detecting means mounted in an exhaust pipe of said engine for detecting the air-to-fuel ratio of the mixture supplied to said engine;

valve position detecting means for detecting a valve position of said bypass valve;

a bypass valve control circuit connected to said air-to-fuel ratio detecting means and said valve position detecting means in which a bypass valve control signal is produced in accordance with the respective outputs of said air-to-fuel ratio detecting means and said valve position detecting means; and

driving means coupled to and driving said bypass valve in response to said bypass valve control signal so that the driving speed of said valve increases as the valve opening increases .

4,084,561

THROTTLE TRIMMING DEVICE

Harvey R. Miller, 3655 E. Amazon, Eugene, Oreg. 97405

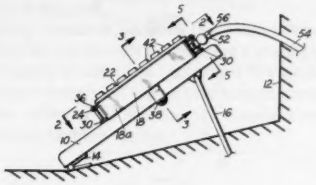
Filed Feb. 9, 1976, Ser. No. 656,123
Int. Cl.[2] F02D *11/08;* G05G *1/14*
U.S. Cl. 123—103 C **3 Claims**

1. A throttle trimming device operative with an internal

combustion engine of the type having a vacuum operating fuel intake system and throttle means for controlling the flow to the fuel intake system, comprising

(a) a flexible air tight bag arranged to be supported on throttle means of an internal combustion engine and arranged to be connected in communication with a vacuum operating fuel intake system of an internal combustion engine,

(b) foot engaging means supported on said air bag,



(c) said air bag being arranged to be collapsible and expandable by vacuum conditions in the fuel intake system for moving said foot engaging means under the operator's foot and automatically backing off or applying the throttle,

(d) and a resilient filler in said air bag arranged in selected vacuum conditions to hold said foot engaging member in extended position.

4,084,562

FUEL METERING DEVICE

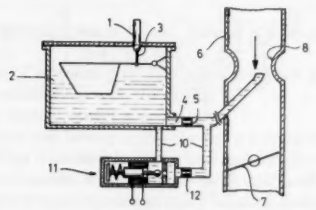
Konrad Eckert, Stuttgart-Feuerbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation-in-part of Ser. No. 365,633, May 31, 1973, abandoned. This application Jul. 16, 1975, Ser. No. 596,261

Claims priority, application Germany, Aug. 8, 1972, 2238990

Int. Cl.[2] F02M *7/00, 13/04;* **F02H** *5/02*

U.S. Cl. 123—119 EC **9 Claims**



1. A fuel metering device for low fuel feed pressures and adapted for use in an externally ignited internal combustion engine of the air/fuel mixture-compressing type, having an air-intake suction tube, which device comprises:

(a) conduit means for conveying fuel to the said suction tube of the engine,

(b) throttle means of determinable cross-sectional throttle area disposed in said conduit means,

(c) bypass duct means for bypassing said throttle means, and

(d) electrical control means responsive to characteristic engine data for switching said bypass means into the fuel flow through said conduit means to bypass said throttle means, thereby varying the ratio of the amounts of fuel and air in the mixture being formed in said suction pipe, wherein said electrical control means is adapted to a work cycle and switches in said bypass means intermittently in dependence on the work cycle, the frequency of which corresponds to the suction frequency of the engine.

4,084,563

ADDITIONAL AIR CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

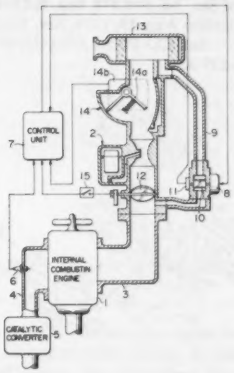
Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Aichi, and Takamichi Nakase, Gamagori, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 9, 1976, Ser. No. 740,175

Claims priority, application Japan, Nov. 11, 1975, 50-135395

Int. Cl.[2] F01N *3/15;* **F02B** *75/10;* **F02M** *37/00*

U.S. Cl. 123—119 EC **5 Claims**



1. An additional air control device for an internal combustion engine having an intake system and an exhaust system comprising:

a carburetor connected to the intake system of said internal combustion engine and including a main passage and a bypass passage, for supplying air-fuel mixture to said engine;

said main passage being provided with a throttle valve for controlling an amount of main air-flow and said bypass passage being provided with a control valve for compensating the air-fuel ratio of said air-fuel mixture by controlling an amount of additional air-flow flowing therethrough;

a drive motor coupled to said control valve for driving the same in order to control the opening degree of said control valve;

gas sensing means mounted in the exhaust system of said engine for sensing the oxygen content of the exhaust gases therein and driving an electrical gas sensing signal;

intake air flow sensing means mounted in the intake system of said engine for sensing the rate of intake air flow to said engine and thereby producing an electrical intake air flow signal;

deceleration sensing means coupled to said throttle valve for sensing deceleration of said engine in accordance with the opening degree of said throttle valve and thereby producing an electrical deceleration signal; and

electronic control means electrically connected to said gas sensing means, said intake air flow sensing means, said deceleration sensing means and said drive motor, said electronic control means being responsive to said intake air flow signal and said deceleration signal for alternately driving and stopping said drive motor repeatedly in a direction determined in accordance with said gas sensing means;

said electronic control means including a comparison circuit for receiving and comparing said gas sensing signal with a preset value as to relative magnitude and thereby determining the direction of operation of said drive motor, a time control circuit responsive to said intake air flow signal to thereby control a duty ratio $\tau a/\tau b$ between a running time τa and a stopping time τb of said drive motor, and a command circuit responsive to said deceleration

signal to increase said duty ratio independently of said time control circuit during the deceleration period of said engine, whereby the air-fuel ratio of mixture supplied to said engine is maintained substantially constant.

4,084,564

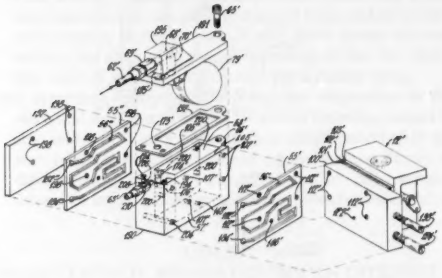
HEAT EXCHANGER SYSTEM FOR CHARGE FORMING APPARATUS

Paul E. Rickert, Oregon, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 504,371, Sep. 9, 1974, abandoned. This application Aug. 19, 1976, Ser. No. 715,695

Int. Cl.[2] F02M *5/10, 15/00*

U.S. Cl. 123—139 AV **21 Claims**



1. Charge forming apparatus including, in combination, a body construction having a fuel and air mixing passage, aperture means for discharging fuel into the mixing passage, a fuel chamber in the body construction, passages in the body construction for conveying fuel from the fuel chamber to the aperture means, means associated with the fuel chamber for regulating flow of liquid fuel into the fuel chamber, means for conveying fuel under pressure from a supply through an inlet passage to the fuel flow regulating means, a heat exchanger member secured to said body construction in heat-transferring relation with a surface of the body construction, said heat exchanger member having an elongated fuel circulating channel therein, the channel in the heat exchanger member being a perforate region of undulated configuration, passage means for delivering fuel from the inlet passage to the channel in said heat exchanger member, a fuel outlet passage in communication with the channel, and means connected with the outlet passage for returning fuel circulating in said channel to the fuel supply.

4,084,565

COMBUSTION AIR SUPPLY APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Heinz Dorsch, Weissach-Flacht, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

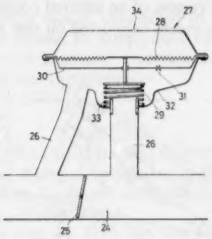
Filed Sep. 2, 1976, Ser. No. 719,706

Claims priority, application Germany, Sep. 2, 1975, 2538921

Int. Cl.[2] F02D *1/04;* **F02M** *7/00*

U.S. Cl. 123—140 MP **7 Claims**

1. An internal combustion engine comprising:
- an air supply line for supplying combustion air to combustion chamber means of said engine,
- a load regulating member disposed in said air supply line for controlling the flow of combustion air therethrough,
- a by-pass line extending in by-passing relationship to said load regulating member from a position upstream of said load regulating member to a position downstream thereof,
- a supplementary air valve disposed in said by-pass line for controlling the flow of combustion air therethrough,
- and supplementary air valve control means for controlling said supplementary air valve as a function of the suction pressure in said air supply line of a position downstream of said load regulating member, wherein said supplementary air valve includes:
- a housing,
- a valve means for controlling the opening of said by-pass line in dependence on its position,
- a membrane connected to and moveable with the valve disk,
- atmosphere opening means in said housing for communicating atmospheric air to one side of said membrane,



- means for communicating the suction pressure in said air supply line to the other side of said membrane,
- and spring means engaged between the housing and the valve means, and
- wherein a separation wall is arranged in the housing between the membrane and the valve means, and wherein a throttle opening is provided in said separation wall.

4,084,566

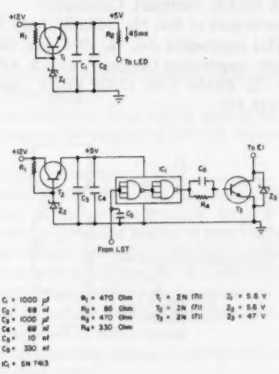
ELECTRONIC BREAKER POINTS FOR THE IGNITION SYSTEM OF A GASOLINE ENGINE

Kurt W. Weiler, P.O. Box 26018, Tempe, Ariz. 85282

Filed Jun. 19, 1975, Ser. No. 588,511

Int. Cl.[2] F02P *1/00, 5/04*

U.S. Cl. 123—148 E **6 Claims**



1. Electronic breaker points for gasoline engines adaptable to conventional distributors comprising:
- a radiation source and a radiation detector mounted so that the latter receives the emission from the former through an air gap with both mounted within the confines of the distributor such that the physical position of said radiation source and radiation detector changes with the working of the normal advance and retard mechanisms of the distributor;
- a chopping wheel with teeth about its periphery mounted fixedly to the rotor shaft of the distributor such that the teeth pass freely between said radiation source and said radiation detector, the said teeth having width, spacing, and number appropriate to the timing and dwell of the engine being controlled;
- a supply circuit to provide a constant current to the radiation source independent of the temperature of said radiation source;

an output transistor to provide switching control to an independent electronic ignition system;

a pulse shaping circuit to receive the output from said radiation detector and provide control to the output transistor;

a supply circuit to provide constant voltage to said pulse shaping circuit independent of the primary automobile supply voltage;

said pulse shaping circuit consisting chiefly of a commercial integrated circuit package containing first and second Schmidt triggers;

a coupling capacitor between the second Schmidt trigger and the output transistor producing a sharp negative pulse at the input of said output transistor to switch said output transistor sharply off which produces an abrupt transition at the collector of said output transistor to switch an electronic ignition system.

4,084,567

CONTACTLESS IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

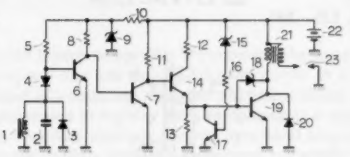
Takasi Hachiga, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 5, 1976, Ser. No. 664,175

Claims priority, application Japan, Mar. 14, 1975, 50-31608

Int. Cl.² F02P *3/02*

U.S. Cl. 123—148 E **2 Claims**



1. An ignition system for an internal combustion engine comprising:

a source of alternating current ignition signals produced in time relationship with the engine;

a direct current power source;

an ignition coil having a primary and a secondary winding;

a switching transistor having a base and a collector-emitter path connected in series with said primary winding;

means for connecting said primary winding and said collector-emitter path across said direct current power source;

means responsive to each cycle of said alternating current ignition signals for operating said switching transistor conductive and nonconductive in timed relationship with the engine; and

means, connected to said direct current power source, and said switching transistor, for bypassing a portion of the base current of said switching transistor when the voltage of said direct current power source exceeds a predetermined value thereby limiting the magnitude of primary current flowing through said primary winding to a predetermined magnitude, said bypassing means including a zener diode for sensing the predetermined value of said power source of voltage; and a bypassing transistor for bypassing a portion of the base current of said switching transistor; said zener diode being connected between said power source and the base of said bypassing transistor, and said bypassing transistor having a collector-emitter path connected across the base-emitter path of said switching transistor.

4,084,568

DECOMPRESSION-TYPE INTERNAL-COMBUSTION ENGINE AND METHOD OF IMPROVING THE CHARACTERISTICS OF SUCH ENGINE

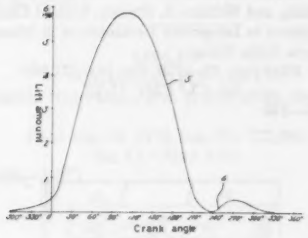
Kazunobu Sato, Wako; Takanori Suzuki; Tadataka Kobayashi, both of Tokyo, and Takeshi Miyazawa, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1976, Ser. No. 646,398

Claims priority, application Japan, Jan. 7, 1975, 50-4285

Int. Cl.² F01L *13/08*

U.S. Cl. 123—182 **4 Claims**



1. A four-cycle internal-combustion engine having a compression chamber, a reciprocable piston, at least one intake valve therefor and a cam for controlling the opening and closing of said intake valve, said cam being shaped to open said intake valve to a maximum degree of lift during the intake stroke and then gradually close said valve to momentarily effect substantial closure of the intake valve in the compression stroke at a crank angle of 240° and then to partially re-open said valve from said crank angle of 240° in gradually increasing amount up to 270° and thereafter to gradually close said valve and effect full closure at 330° whereby compression pressure at engine starting is reduced and at maximum operating speed is substantially unaffected.

4,084,569

TILE CUTTER

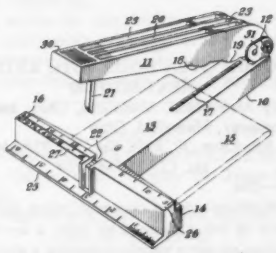
Alan Gould Chrismas, 8 Cleveland Close, Worthing, West Sussex, England

Filed May 17, 1976, Ser. No. 686,818

Claims priority, application United Kingdom, May 20, 1975, 21387/75

Int. Cl.² B28D *1/32*

U.S. Cl. 125—23 R **20 Claims**



1. A tile cutter comprising a longitudinally extending base member, an arm hingedly connected to said base member at one end thereof, a ridge upstanding fom a surface of said base member and extending along a portion of said base member from the region of said one end, a slot extending along said arm from the region of the hinge connection, a pair of shoulders dependent from said arm on either side of said slot and extending along a portion of said arm from the region of said hinge

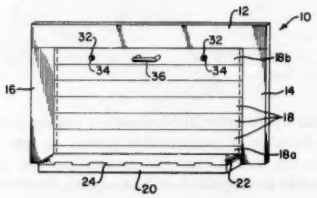
connection, and means for maintaining said slot substantially parallel to the ridge on the base member during hinging motion of said arm, wherein the surface of each shoulder adjacent to the base member is in the form of a part of the surface of a right circular cylinder, the axis of which is parallel to the axis of said hinge connection.

4,084,570

FIREPLACE CLOSURE AND SAFETY DEVICE

Adrian O. Rule, and William E. Bartley, both of Chagrin Falls, Ohio, assignors to Integrated Development & Manufacturing Co., Chagrin Falls, Ohio

Filed Sep. 10, 1976, Ser. No. 721,969
Int. Cl.² F24C *15/02*
U.S. Cl. 126—140 **5 Claims**



1. A fireplace heat retaining and safety closure device comprising

a frame means designed to partially extend over a fireplace opening in flush contact with the opening,

a storage box comprising the bottom horizontal member of the frame, said box having a top closure which is hinged to pivot toward the fireplace opening,

a plurality of hinged, horizontal, metal slats of sufficient width and height to extend over the full opening of the frame means, and

means to secure one end of the metal slats across the top of the frame means whereby a slat adjacent the storage box is pressed against the frame means by the top of the storage box when it is pivoted toward the fireplace opening to hold the metal slats in a flush relationship to the face of the frame means around the periphery thereof.

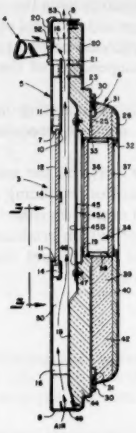
4,084,571

SEE-THROUGH OVEN DOOR WITH RETICULATED HEAT SHIELD

Robert Henry McFarland, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed Sep. 20, 1976, Ser. No. 724,946
Int. Cl.² F23M *7/04*
U.S. Cl. 126—198 **10 Claims**

1. In combination with a domestic range having an oven cavity capable of being cleaned by heat, a see-through oven door comprising an outer panel containing a glass window, an inner frame inwardly spaced from and attached to said outer panel and containing a window pack aligned with said window for viewing the oven cavity, said window pack being surrounded by insulation, a reticulated metallic heat shield fixedly secured in said space between said window and window pack to assist in retaining the heat in the oven cavity and thus correspondingly to decrease the surface temperature of the outer panel and glass window, and means for circulating cooling air upwardly through the space between said outer panel and inner frame and past the reticulated metallic heat shield to



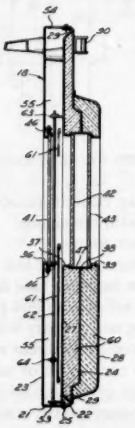
provide a cooling air wash therefor to assist in decreasing the surface temperature of the outer panel and glass window.

4,084,572

SELF-CLEANING OVEN SHUTTER DOOR

Alvin J. Schettl, and Charles R. Gorski, both of Grand Rapids, Mich., assignors to Kelvinator, Inc., Grand Rapids, Mich.

Filed Oct. 28, 1976, Ser. No. 736,552
Int. Cl.² F24C *15/04*
U.S. Cl. 126—200 **2 Claims**



1. An oven assembly comprising a frame enclosing an oven cavity, an opening in the frame for access to the cavity, a door hinged at one side thereof on the frame for closing the opening, a window in the door for viewing the contents of the cavity during cooking operation, the window being closed by glass sheet means, manually operable shutter means selectively movable within the door, means guiding said shutter means for translation when the door is open between an open position allowing visual inspection of the interior of the cavity through the window when the door is closed, and a closed position preventing direct radiation through the window from the cavity when the door is closed, indicator means within the door remote from the hinge side thereof means for guiding said indicator means for translation in a direction parallel to the movement of said shutter means responsive to the position of

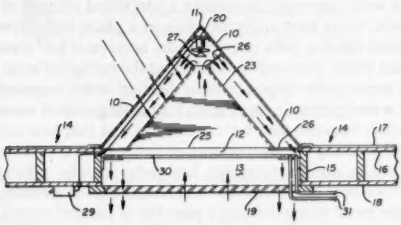
the shutter, said indicator being in a first position when the shutter is in its open position and in a second position when the shutter is in its closed position, sensor means arranged on the frame to protrude into the door to sense the presence of the indicator means in the second position when the door is closed, the sensor means being arranged to sense an open condition of the door and/or the first position of the indicator means in a manner detectably different from the manner in which both the closed door and the second position of the indicator are simultaneously sensed whereby the sensor means is adapted to be used to control operation of the oven heater by permitting operation thereof only when the door and shutter are closed and by preventing operation of the oven heater for pyrolytic cleaning when the door is open and/or the shutter is open.

4,084,573

PYRAMIDAL SOLAR HEATER

Nick J. Shubert, 893 E. Indianola Ave., Youngstown, Ohio 44502

Filed Jul. 15, 1976, Ser. No. 705,588
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **7 Claims**



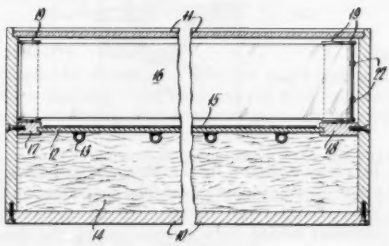
1. A solar heater comprising a pyramidal shaped structure having a square base and sloping sides meeting at an apex, said sides formed of translucent material, said base defining an open bottom positioned in registry with an opening in a supporting structure, a smaller similarly formed pyramidal shaped structure disposed within said first mentioned pyramidal shaped structure in spaced relation thereto and having an opening in its uppermost end, air moving means positioned in the apex of said first mentioned pyramidal shaped structure for moving air downwardly in wiping relation to said first mentioned pyramidal shaped structure.

4,084,574

HEAT INSULATOR

Marcel J. E. Golay, 1095 Lutry, Vaud, Switzerland, assignor to Marcel Golay, Switzerland

Filed Jun. 30, 1975, Ser. No. 591,694
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **4 Claims**



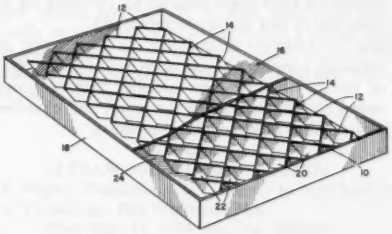
1. Radiant heat absorbing apparatus comprising a housing having at least one clear side, radiation absorbing means in said housing comprising a radiation absorbing surface facing said clear side, a radiation transparent plate closing said clear side of the housing and a plurality of spaced ribbonlike elements extending between and spaced from said radiation absorbing surface and said transparent plate to restrict circulation of gas between said surface and said plate and minimize loss of heat through convection, said ribbonlike elements being very thin and said housing includes ribbon supporting means along a pair of opposite edges of said radiation absorbing means, said supporting means maintaining said ribbons in tension, said supporting means each comprising a plurality of rollers, said ribbon is threaded about said rollers and tensioning means is attached to at least one end of said ribbon to maintain it under tension at all times.

4,084,575

SOLAR HEATER UNIT

Dwight Harold Nicewonger, Rte. 1, Box 495H, Ramona, Calif. 92065

Filed Sep. 13, 1976, Ser. No. 722,566
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **9 Claims**



1. A solar heating unit being adapted for mounting in proximity to a heated building comprising:
a planar floor section,
a plurality of intersecting panels positioned on said floor section and forming a plurality of cells,
means interconnecting said panels at the intersections of said panels,
each of said cells having mutually abutting rear side walls and front side walls, said rear side and front side walls being at an acute angle to said planar floor section,
each cell including a front side wall and a rear side wall that are in parallel planes,
at least some of said side walls of each cell being coated black,
a cover means over said cells for admitting light energy and retaining heated air,
circulation means for circulating a working fluid in heat transfer relationship with said cells for extracting heat converted from solar energy by said cells and for delivering said extracted heat to the heated building.

4,084,576

BULB-TYPE SOLAR ENERGY COLLECTOR

Yu Kun Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

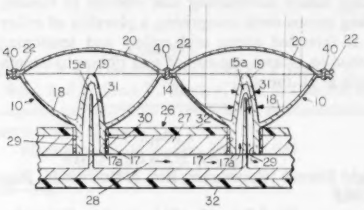
Filed May 3, 1976, Ser. No. 682,705
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **21 Claims**

1. A solar collector apparatus comprising a unitary hollow glass member defining
an endless annular parabolic wall surface disposed about a focal axis having an enlarged open end and an apex end, and
an elongated hollow tubular wall coaxial with said axis at said apex end of the parabolic surface, and inwardly depending along the focal axis and encircled by said para-

bolic surface, the inner depending axial of end of said tubular wall being closed and the opposite axial end thereof being open and disposed outwardly of the apex end of the parabolic surface, said tubular wall defining an internal fluid chamber,

a continuous reflective coating layer on said parabolic surface and facing the focal axis,

an energy absorbing coating on the outer surface of the



tubular wall disposed within said encircling parabolic surface,

a transparent glass cover member for covering the enlarged open end of said unitary member, and

means for sealingly connecting the glass cover member about the periphery of said open end of the parabolic wall of the said hollow glass member thereby providing a sealed closed chamber of the latter, said chamber being evacuated to subatmospheric pressure.

4,084,577

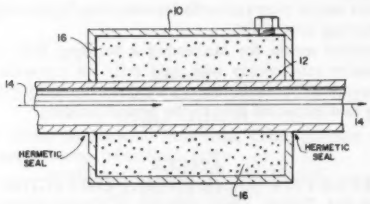
SOLAR RADIATION CONVERTING METHOD AND MEANS

William A. Rhodes, 4421 N. 13th Pl., Phoenix, Ariz. 85014

Continuation-in-part of Ser. No. 710,278, Jul. 30, 1976, abandoned. This application Aug. 20, 1976, Ser. No. 716,247

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **12 Claims**



1. A method whereby a halogen is introduced in fluid suspension into a hermetically sealed light transmitting enclosure; said enclosure being exposed to radiant light energy; said radiation passing through a surface sealing said enclosure; then into a halogen in suspension in said enclosure; said halogen to transmit infrared heat energy onto a receiving surface wherein said heat is extracted for use; said halogen intercepts and converts visible light spectra into infrared heat energy which likewise impinges upon said receiving surface thereby to increase the available heat energy over and above the amount received from the usual infrared radiation of the spectra.

4,084,578

SOLAR WATER HEATER OF NATURAL CIRCULATION TYPE

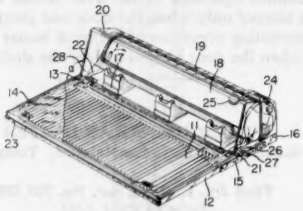
Toshihiro Ishibashi, Kosai, Japan, assignor to Yazaki Sogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 668,190

Claims priority, application Japan, Mar. 24, 1975, 50-39187[U]

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **3 Claims**



1. A solar water heater of natural circulation type comprising a water reservoir containing a controlled amount of water therein, a flat heat collector lying in a plane and disposed in inclined relation with respect to the horizontal and connected to said water reservoir for collecting the energy of solar radiation incident thereupon thereby heating water supplied from said water reservoir, and means for causing natural circulation of water between said water reservoir and said heat collector thereby raising the temperature of water up to a value suitable for use in utilities requiring hot water supply, wherein the improvement comprises that said heat collector includes a pair of thin metal sheets defining a plurality of parallel spaced water passages, said water passages being formed by parallel immediately adjacent corrugations in at least one of said sheets having edge portions contacting the other of said sheets, one edge portion of each corrugation being welded to the other of said sheets and the second edge portion of each corrugation normally being in physical contact only with the other of said sheets.

4,084,579

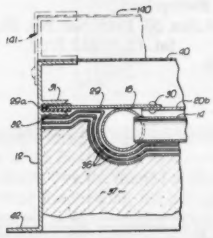
LIGHTWEIGHT SOLAR HEATER EMPLOYING TUBES AND CHANNELS

Ying-Nien Yu, Marina del Rey, Calif., assignor to Ying Mfg. Corporation, Gardena, Calif.

Filed Jun. 14, 1976, Ser. No. 695,775

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **8 Claims**



1. In a solar collector, the combination comprising

a. a multiplicity of tubes to pass fluid and to receive heat, and

b. channel shaped heat transfer members having flanges, the members having webs interconnecting the flanges and presented to receive solar radiation,

c. the tubes clamped between and in heat transfer contact with flanges on successive of said members to form a tube and member assembly, whereby the solar heated channel

members transfer heat via the tube clamping flanges to the tubes,

d. there being retainers directly attached to certain of said members and independently of said tubes for exerting force acting through said members to hold the flanges and tubes in clamped enterengagement,

e. there also being a first header pipe in communication with certain ends of said tubes, at least one of said retainers overlying said header pipe and attached to certain ends of said members to exert force thereon.

4,084,580

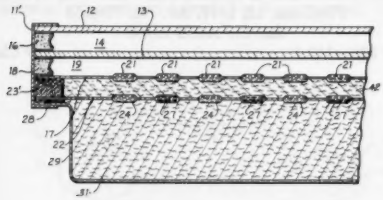
COMBINATION SOLAR COLLECTOR AND HEAT EXCHANGER

Charles Frederick Roark, 24 Maple La., Brownsburg, Ind. 46112

Filed Jul. 28, 1976, Ser. No. 709,379

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **13 Claims**



1. A solar energy collector/heat exchanger assembly comprising:

a frame;

first and second window panes secured in said frame in parallel spaced relation and having a dry gas filled and sealed space between them for thermal insulation beween them;

a collector panel secured in said frame under and in parallel spaced relation to said second window pane and having a first passageway therein for a working fluid;

a heat exchanger panel secured in said frame in parallel spaced relation to said collector panel and having a second passageway therein for said working fluid and a third passageway therein for a utilization fluid;

and means coupling said first and second passageways together to make a working fluid circuit in said frame whereby heat energy collected in said working fluid in said collector panel is made available for heat exchange to said utilization fluid in said heat exchanger panel.

4,084,581

APPARATUS FOR FOCUSING AND USING SOLAR ENERGY

Francis E. Vigoureux, Residence la Grande Candelle-Allee des Pins, Marseille, France (13009)

Filed Sep. 29, 1976, Ser. No. 727,842

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—271 **8 Claims**

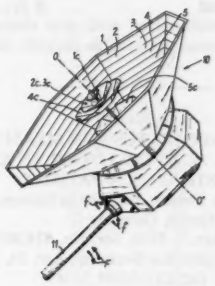
1. Apparatus for focusing by reflection and for using solar energy and comprising: outer reflectors and inner back-reflectors arranged according to an invariable geometry and distributed symmetrically with respect to an axis;

means adapted to maintain said axis directed towards the sun during daylight hours;

and heat-collecting means situated along said axis at a position such that said means receive the solar rays reflected by said reflectors and back-reflectors,

each of said reflectors and back-reflectors having a rectilinear appearance in section through any plane passing through said axis and being arranged so that said heat-collecting means are placed beyond the arrangement of said reflectors and back-reflectors, in the direction of arrival of the incident solar rays;

said reflectors being grouped so as to form a practically continuous surface whose general appearance is that of a truncated cone or pyramid but whose section through said



plane is a broken line whilst the back-reflectors are staggered axially and radially so that solar rays reflected directly by said reflectors and reflected a second time by said back-reflectors arrive at the heat-collecting means without being intercepted by another of said reflectors and back-reflectors.

4,084,582

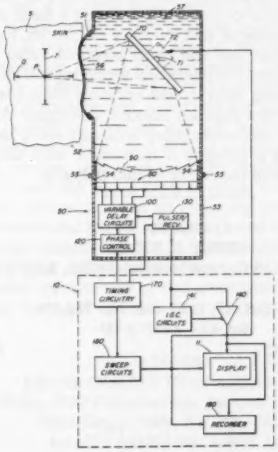
ULTRASONIC IMAGING SYSTEM

Anant K. Nigam, Plantation, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,898

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—2 V **24 Claims**



1. A portable scanning module for use with an ultrasonic apparatus for imaging sections of a body by transmitting ultrasonic energy into the body and determining the characteristics of the ultrasonic energy reflected therefrom, said apparatus including timing means for generating timing signals; an energizer/receiver operative in response to the timing signals; and display/record means synchronized with said timing signals for displaying and/or recording image-representative signals from the energizer/receiver; said portable scanning module comprising:

a fluid-tight enclosure having a scanning window;

transducer means in said enclosure for converting energy

from said energizer/receiver to periodic ultrasonic energy and for converting reflected ultrasonic energy to electrical signals;

a fluid contained in said enclosure, said fluid serving as a transmission medium for ultrasound;

reflective scanning means disposed in said fluid for reflecting ultrasonic energy as between said transducer means and said window; and

driving means synchronized with said timing signals for moving said scanning means in periodic fashion in said fluid.

4,084,583

METHOD AND APPARATUS FOR MEASURING THE BIOELECTRICAL ACTIVITY UNDER AN ELECTRODE RESTING ON A PATIENT

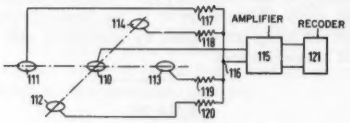
Bo Hjort, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 7, 1976, Ser. No. 674,607

Claims priority, application Germany, Apr. 24, 1975, 2518269

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 R **5 Claims**



1. A method of measuring the bioelectrical activity occurring in the region under a signal electrode placed on a patient, wherein a plurality of auxiliary electrodes placed on the patient are used, said method comprising producing a mean potential value of the potentials of said auxiliary electrodes, forming a difference value between said mean potential value and the potential of said signal electrode, and supplying said difference value to a recording device, said auxiliary electrodes being exclusively electrodes disposed adjacent said signal electrode, and said auxiliary electrodes being arranged about the signal electrode to form a polygon if connected, with said signal electrode disposed in the center of said polygon.

4,084,584

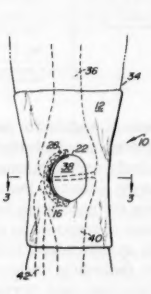
KNEE SLEEVE

Garnett E. Detty, 525 General Muhlenberg Rd., King of Prussia, Pa. 19406

Filed Oct. 15, 1976, Ser. No. 732,554

Int. Cl.² A61F *3/00*

U.S. Cl. 128—80 C **8 Claims**



1. A sleeve adapted to be placed over the knee, said sleeve being configured to anotomically conform to the thigh, knee and upper calf, said sleeve comprising a resilient elastomeric foam sheath having a fabric covering, said sheath being formed from two pieces, with a first piece being configured to encircle the knee and sides of the leg in the area of the knee and the second piece being secured to said first piece by a pair of spaced, substantially parallel seams, said seams being on opposite sides of the center of the leg and knee, an opening formed in the front of said sleeve, said opening being adapted to permit the patella to project therethrough when the sleeve is on a user's leg, and restrictor means adjacent said opening, said restrictor means being adapted to bear against the patella and to prevent the patella from moving when the sleeve is on a leg.

4,084,585

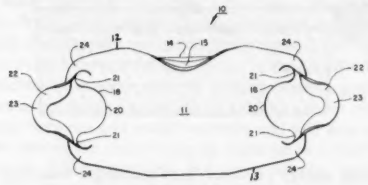
FACE MASK

Howard J. Venaleck, 5869 Hillside Dr., Watertown, N.Y. 13601

Filed Jan. 12, 1977, Ser. No. 758,658

Int. Cl.² A62B *23/00*

U.S. Cl. 128—146.2 **9 Claims**



1. A face mask shaped to cover the nose and mouth of the wearer, said face mask comprising:

a. a blank of resilient, foamed resin material having a central region and opposite end regions, each opposite end region of said mask having a slit spaced inward from the end of said mask;

b. each of said slits extending from upper to lower regions of said mask;

c. a central portion of each of said slits being U-shaped and curving inward toward said central region of said mask;

d. said end regions of said mask having a peripheral edge spaced approximately equidistant from said slits so said material between said slits and said ends of said mask has an approximately uniform width and forms a pair of ear loops having U-shaped portions; and

e. said ear loops being bendable in a one-half turn to dispose said U-shaped portions to extend outwardly away from said central region for resiliently looping over the ears of the wearer to hold said mask in place.

4,084,586

TUBULAR SUPPORT FOR ENCLOSING A BODY MEMBER

Lon R. Hettick, 5050 Garford, Long Beach, Calif. 90815

Filed Oct. 13, 1976, Ser. No. 731,616

Int. Cl.² A61F *13/00*

U.S. Cl. 128—157 **15 Claims**

1. A tubular support for enclosing a body member, comprising:

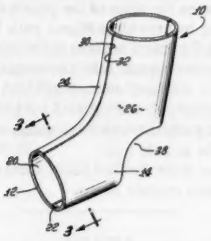
an elastic generally tubular member having an opening for receiving a body member,

said elastic member being stretchable in all directions, and

a facing on the interior surface of said elastic member having a relatively low coefficient of friction,

said facing having the same stretch rate in all directions as

the elastic member and being free of tension when not stretched on the body member,



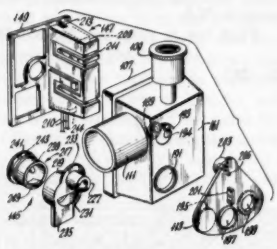
said facing and elastic member having absolute memory and constant equal gripping pressure on all parts of the body member covered and intended to be supported.

4,084,587

FLUID HEATING APPARATUS

Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.

Filed Jul. 17, 1975, Ser. No. 596,789
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—193 **1 Claim**



1. In combination with a medical device including a nebulizer having a venturi-type nozzle and a fluid supply, a fluid heating apparatus, comprising:

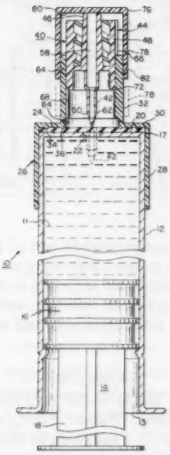
a housing having a chamber provided therein, said chamber having a truncated pyramidal shape and having access openings through the walls thereof connected to said fluid supply and connected to said nozzle; a truncated pyramidal shaped insert positioned in said housing and having situated therewithin a heating element having electrical leads thereto, said heating element including a rectilinearly shaped, wound resistance wire heater element, and a rubber coating material surrounding said heater element, the outer surface of said coating material providing a truncated pyramidal shape and including a relieved channel in the outer surface thereof, said channel traversing said insert surface in rectilinear maze fashion, and forming a passageway from said fluid supply opening to said nozzle opening at the interfacing surfaces of said chamber walls and said insert when said insert is inserted into said chamber in a pressure fit.

4,084,588

PARENTERAL DRUG STORAGE DEVICE WITH CLOSURE PIERCING COUPLING MEMBER

Elmer A. Koenig, Kirkwood, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Mar. 19, 1976, Ser. No. 668,388
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 R **27 Claims**



1. A parenteral drug storage device comprising a container for receiving the parenteral drug, movable piston means disposed in said container and closing one end thereof, said container having an opening at the opposite end, cap means connected to said opposite end of said container in fixed relation thereto, separate pierceable seal means sealingly closing said opening, and a movable fluid coupling member connected to said cap means having a fluid coupling portion with a luer slip connector at one end thereof adapted for direct contact fluid tight connection with a complementary luer fluid coupling element for passing drug from said container to the complementary coupling element, a seal piercing portion at the opposite end thereof for piercing said seal means, and means connecting said coupling portion in fluid communication with said piercing portion, said fluid coupling member being slidable relative to said cap means from an initial unarmed position to an armed position wherein said piercing portion has pierced said seal means and has moved through said opening to thereby connect said coupling portion in fluid communication with the interior of said container, said piston means being movable toward said opposite end of said container for forcing parenteral drug from said container into said coupling portion.

4,084,589

URINE COLLECTION APPARATUS

Ruth L. Kulvi, 3337 Cockator Rd., Augusta, Ga. 30907

Filed Jun. 7, 1976, Ser. No. 693,648
Int. Cl.[2] A61F *5/44*; A61M *1/00*
U.S. Cl. 128—278 **10 Claims**

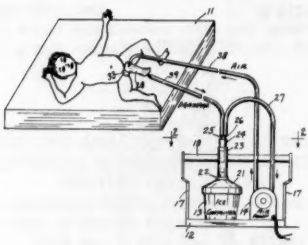
10. A urine collection device particularly adapted for use with children, and for collecting precise quantities of uncontaminated urine, comprising

a bag formed of thin flexible plastic material having a urine-receiving opening at its top end portion, means to adhesively sealingly secure said bag to a patient in a position to receive urine through said opening with the bag sealed to the patient's skin around said opening, said bag having a urine outlet at its lower end and an air inlet opening at its top portion;

urine receiving and measuring means to receive and precisely measure the amount of urine passing into said bag;

drainage conduit means to pass the urine from the urine outlet of said bag to said urine receiving and measuring means;

means to provide air flow to said bag through said air inlet opening to induce flow of urine out of said bag and



through said drainage conduit and to keep the interior of said bag dry, said means comprising an air pump and an air conduit passing from said air pump to the air inlet opening at the top end portion of said bag; and

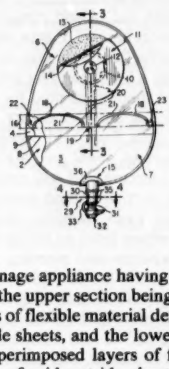
means to cool said urine receiving and measuring means.

4,084,590

STOMA DRAINAGE APPLIANCE

William Russell Caraway, Walnut, Calif., and Clarence Mark Falkingham, Largo, Fla., assignors to Howmedica, Inc., New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,553
Int. Cl.[2] A61F 5/44; A61M 3/00
U.S. Cl. 128—283 **9 Claims**



1. In a stoma drainage appliance having a pouch with upper and lower sections, the upper section being constructed of four superimposed layers of flexible material defined by two outside sheets and two inside sheets, and the lower section being constructed of two, superimposed layers of flexible material defined by extensions of said outside sheets, all of said layers being sealed to each other about their periphery to form said pouch, the lower edges of the two inside sheets extending freely across the pouch from one peripheral side edge to the other, an inlet opening in the upper section of the pouch communicating with the space between the two inside sheets and through which drainage fluid from the stoma is received, an outlet opening in the lower section of the pouch communicating with the space between the two outside sheets for draining collected fluid from said pouch, and sealing means disposed between said inlet opening and the lower edges of the two inside sheets for sealing said sheets together along a zone spaced from and extending generally along the lower edges to enable said lower edges to function as a valve deterring fluid collected in said lower section from flowing in an upward direction between said two inner sheets and into said upper section, the improvement wherein:

(a) said sealing means is defined by two spaced arcuately shaped seal lines disposed along said zone with the concave sides facing away from said inlet opening and with an unsealed space between the seal lines and an unsealed space between each seal line and the peripheral side edges of the pouch;

(b) the unsealed space between the seal lines is centrally located between the sides of the pouch directly below said inlet opening to provide a direct path between said inlet opening and the lower section of the pouch for passage of drain tubes entering said inlet opening, the convex sides of said seal lines defining arcuate guiding surfaces for guiding the drain tubes entering said inlet opening in a generally straight path through said space and into the lower section of the pouch; and

(c) the seal lines unite the two inside sheets to each other and to the adjacent outside sheets.

4,084,591

WATER DISPERSIBLE ABSORBER FOR BLOOD AND THE LIKE

Toshio Takebe, Ohmiya, and Takashi Yamazaki, Ohtsu, both of Japan, assignors to Eisai Co., Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,264
Claims priority, application Japan, Feb. 14, 1975, 50-17969
Int. Cl.[2] A61F 13/20
U.S. Cl. 128—285 **8 Claims**

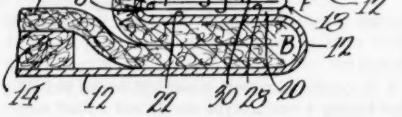
1. A soft vaginal tampon for the absorption of menstrual blood, which comprises a filamentary material of a one to three carbon alkyl or a one to three carbon hydroxyalkyl substituted cellulose ether having thermogelation properties in water which material is substantially water soluble at room temperature yet is substantially insoluble in menstural blood at body temperature, and which maintains its softness without immediately dissolving after absorbing menstural blood in the vagina.

4,084,592

DISPOSABLE PREFOLDED DIAPER WITH PERMANENTLY ATTACHED ADHESIVE CLOSURE SYSTEM

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 8, 1975, Ser. No. 539,554
Int. Cl.[2] A61F 13/16
U.S. Cl. 128—287 **12 Claims**



1. A disposable diaper, comprising:

an absorbent pad assembly having a front surface, a back surface, a pair of side edges, a longitudinally extending central panel, and panel means overlying the front surface of the central panel adjacent its sides, said panel means including a pair of longitudinally extending outermost panels defining the side edges of the pad assembly;

a pair of pressure-sensitive tape strips having a first portion fixedly secured to the back surface of said outermost panels adjacent the side edges of the pad assembly and a second securement portion extending from an end of the first portions adjacent the side edges of the pad assembly for use in securing the diaper about an infant during placement of the diaper; and

release sheet means positioned on the pad assembly at a location on another panel to cover adhesive on the securement portions of the strips, said securement portions of the

strips being attached to the release sheet means to retain the outermost pleats in their overlying relationship prior to placement of the diaper.

4,084,593

BLADDER TRAINING APPARATUS

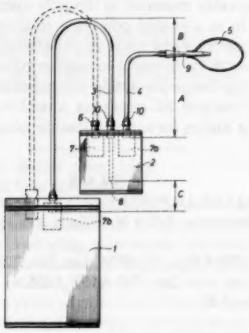
Harry Sigurd Valdemar Järund, Lund, Sweden, assignor to Jarund Develio AB, Fjallbacka, Sweden

Filed Apr. 12, 1976, Ser. No. 676,144

Claims priority, application Sweden, Apr. 15, 1975, 7504312; Jul. 16, 1975, 7508120

Int. Cl.[2] A61F 5/44

U.S. Cl. 128—295 **13 Claims**



1. Apparatus for continuously emptying the urine bladder while at the same time training the bladder of an incontinent patient, comprising a pressure chamber locatable below the bladder and having an inlet at its upper end connectable to said bladder, a collecting container connected to said pressure chamber and located below said pressure chamber, the connection between the pressure chamber and the collecting container being formed as a pipette to permit filling of said pressure chamber to a predetermined level, and force the air therein to escape through said inlet to achieve a gradual pressure increase in the bladder resulting in expansion thereof, followed by automatic emptying of bladder and pressure chamber resulting in a contraction of the urine bladder, and uni-directional valve means arranged in association with said pressure chamber to permit air to be introduced therein to equalize the partial vacuum occuring within said chamber after emptying.

4,084,594

SURGICAL INSTRUMENT AND HANDLE ASSEMBLY THEREFOR

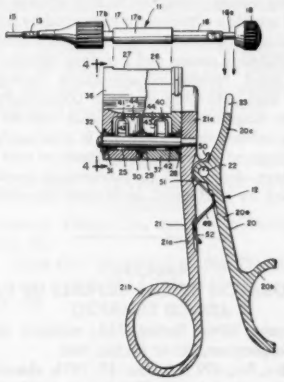
Donald J. Mosior, Mundelein, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 8, 1976, Ser. No. 730,870

Int. Cl.[2] A61B 17/32

U.S. Cl. 128—311 **28 Claims**

18. In combination, a surgical instrument having an elongated sheath with distal and proximal ends, a jaw assembly at the sheath's distal end, a housing at the sheath's proximal end, an operating rod extending through said sheath and distally connected to said jaw assembly for operating the same, and a plunger connected to said rod within said housing and having a stem projecting axially from said housing, and a handle assembly engagable with and disengagable from said instrument for operating the same, said handle assembly comprising a pair of vertically extending handles pivotally connected to each other by pivot means having a horizontally-extending pivot axis, said handles having finger-gripping portions disposed below the pivot means and stem-engaging portions projecting above said pivot means, one of said handles having a support shaft projecting away from the other of said handles, and a pair of wing lock members pivotally mounted upon said shaft, said wing lock members having upper clamping portions disposed above said shaft and wing portions projecting below said shaft, said clamping portions having complementary recesses together defining a bore receiving said housing of said instrument, spring means urging said wing lock members into closed positions wherein said housing is clamped within said bore and said wing portions are spaced apart, said wing lock members being pivotal into open positions for releasing said instrument housing by manually squeezing said wing portions together to overcome the force of said spring means.



4,084,595

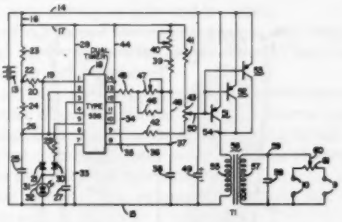
TRANSCUTANEOUS NERVE STIMULATOR

Curtis H. Miller, Burnsville, Minn., assignor to Med General, Inc., Minneapolis, Minn.

Filed Jul. 15, 1976, Ser. No. 705,677

Int. Cl.[2] A61N 1/36

U.S. Cl. 128—422 **7 Claims**



1. A transcutaneous nerve stimulator comprising in combination:

(a) an astable multivibrator having a first resistance/capacitance timing circuit for controlling the frequency of the output pulses produced by said astable multivibrator and a second resistance/capacitance timing circuit for controlling the pulse width of said output pulses;

(b) semiconductor current control means coupled by variable impedance means to receive said output pulses from said multivibrator;

(c) a source of direct current voltage connected to said multivibrator, said first and second resistance/capacitance circuits and to said semiconductor current control means;

(d) a transformer having a primary winding connected in series with said semiconductor current control means, the series combination being connected across said source of direct current voltage, and a secondary winding;

(e) means coupling said secondary winding to first and sec-

ond pairs of output terminals to which stimulator electrodes may be connected;
(f) a third resistance/capacitance timing circuit connected across said source of direct current voltage;
(g) a voltage divider connected to said source of direct current voltage for sensing the magnitude thereof;
(h) indicating means connected to said voltage divider; and
(i) a second astable multivibrator energized by said source of direct current voltage having an output terminal coupled to said indicating means and a trigger terminal connected to said third resistance/capacitance timing network, whereby said indicating means is continously energized when the magnitude of said direct current voltage is above a predetermined level and is alternately energized and deenergized when the magnitude of said direct current voltage drops said predetermined level, at a rate determined by said third resistance/capacitance timing circuit.

4,084,596

BODY OF TOBACCO WITH A DEPOSIT OF PARTICLES ADDED THERETO

Harold Grossman, Silver Spring, Md., assignor to Montclair Research Corporation, Silver Spring, Md.

Division of Ser. No. 479,103, Jun. 13, 1974, abandoned. This application Jul. 20, 1976, Ser. No. 707,071
Int. Cl.[2] A24B *15/02*
U.S. Cl. 131—17 R **3 Claims**

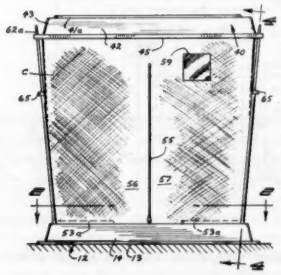
1. A body of divided tobacco to be burned, the tobacco having a deposit thereon of particles of a water-insoluble, hydrophobic, moisture-laden substance which releases moisture upon the burning of the tobacco, the major ingredient of the substance being water.

4,084,597

FISH HOUSE

Richard B. Compton, Rte. 3, E. River Dr., Cambridge, Minn. 55008

Filed Oct. 18, 1976, Ser. No. 733,318
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—1 R **1 Claim**



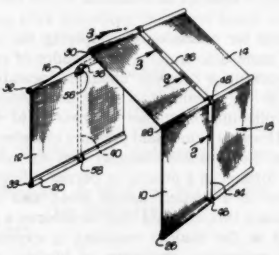
1. A fish house comprising a base having a floor and walls joined to the floor to extend over the floor in surrounding relationship thereto, a roof of a size and shape to have the base nestingly extended thereinto, the roof being of sufficient rigidity to normally maintain a preselected shape, and means extending between the roof and the base to support the roof in an elevated condition relative the base and in conjunction with the roof and base define an openable chamber, the base walls including interior front, rear and side walls joined to said floor to extend upwardly and horizontally outwardly thereof, a top perimetric flange joined to the interior walls to extend outwardly thereof at a substantially higher elevation than the floor, an exterior perimetric wall joined to the top perimetric flange to extend downwardly and outwardly thereof, said exterior wall having a lower edge, and a base perimetric flange joined to the exterior wall lower edge to extend generally horizontally outwardly thereof, the roof including a top roof wall of a size and shape to completely overhang the base top flange, said roof top wall having a peripheral outer edge, a perimetric roof wall having a lower peripheral outer edge and being joined to the roof top wall peripheral outer edge to extend downwardly and outwardly thereof, and a lower perimetric roof portion joined to the perimetric roof wall peripheral edge, each of the base top flange and the roof lower portion being rectangular and defining a rectangular opening, the maximum length and width dimensions of the base top flange being substantially smaller than the corresponding dimensions of the roof lower portion opening, each of the roof lower portion and the base top flange having a plurality of pole openings, and the above mentioned means including a plurality of poles removably mounted in the pole openings for supporting the roof in an elevated condition relative to the base, and collapsible means having a upper peripheral edge attached to the roof lower portion and a lower peripheral edge mounted on the base top flange for acting in cooperation with the roof and base to enclose an occupant chamber, said collapsible means having means forming a closable entry.

4,084,598

LINKED COLLAPSIBLE SHELTER STRUCTURE

Orman M. Rainwater, 947-½ N. Wilcox Ave., Los Angeles, Calif. 90038

Filed Sep. 30, 1976, Ser. No. 728,181
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—3 E **4 Claims**



1. In a collapsible shelter structure:
a. a resilient stretchable webbing having a plurality of transverse pockets spaced along the length of the webbing and dividing the webbing into a series of panels, each pocket being at least partially discontinuous at its midlength position to provide an opening on the outside of said shelter;
b. a corresponding plurality of tubular bars or poles accommodated in the pockets, there being two end bars for the pockets at the ends of the webbing and intermediate bars for the other pockets, the intermediate bars or poles having a circular cross-sectional configuration;
c. a corresponding plurality of links, each of the links having a hub journalled at the center of the corresponding bars in alignment with the opening of the corresponding pocket;
d. each of the links for the intermediate bars or poles having rigidly connected to its corresponding hub, a pair of angularly spaced pins projecting radially therefrom in substantially coplanar relationship on the outside of said shelter;
e. each of the links for the end bars or poles having rigidly connected to its corresponding hub, a single pin projecting radially therefrom on the outside of shelter;
f. a plurality of tubular struts on the outside of said shelter having opposite ends telescoped over pins of links for adjacent poles or bars to hold said poles or bars apart with the webbing taut; said struts being of fixed length and movable into connected relationship with said pins one after the other, the connection to the second connector

element being established by stretching the webbing until the telescopic connection is made; and

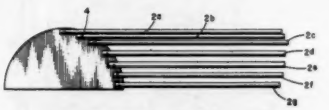
g. the angular spacing of the pins of said intermediate links determining the angularity between adjacent panels and, thereby, the angular orientation of all panels of said shelter structure.

4,084,599

COLLAPSIBLE TEMPORARY OUTDOOR ENCLOSURE

Billy H. Matthews, 2659 Heritage Cir., Las Vegas, Nev. 89121

Filed Nov. 22, 1976, Ser. No. 743,866
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—4 R **17 Claims**



1. A collapsible shelter comprising:

a pair of spaced base members;

a plurality of shaped struts spanning between said base members, said struts mounted at hinge points on said base members for swinging movement between a collapsed position and an erected position, said hinge points arranged in an arcuate pattern on each base member along a line extending from adjacent the bottom edge of said base member upward and curving through an arc of approximately 90°;

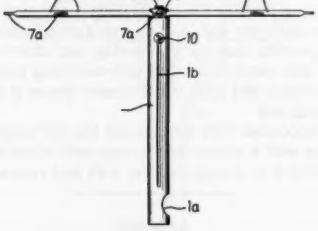
a sheet of flexible material supported on said plurality of shaped struts, so that when said struts are in said collapsed position all of said struts lie horizontally on top of one another and generally parallel to one another with the sheet folded therewith, and when said struts are in said erected position they assume a fan-like relationship, extending radially outward from said base members, and said sheet is stretched across said struts to provide a shelter in accordance with the shapes of said struts.

4,084,600

UMBRELLA

Harry Rudolph dePolo, 480 Park Ave., New York, N.Y. 10022

Filed May 12, 1977, Ser. No. 796,439
Int. Cl.[2] A45B *11/00, 15/00, 19/00*
U.S. Cl. 135—20 R **10 Claims**



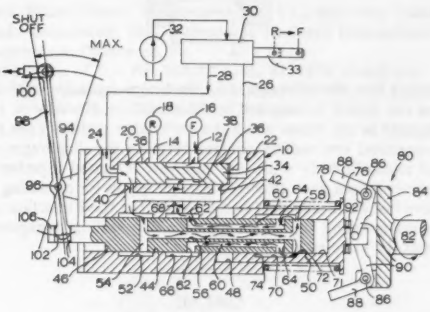
1. An umbrella comprising an elongate tubular shaft having upper and lower ends and having a longitudinally extending slot between said ends, rib carrier means longitudinally movable in said shaft, a plurality of elongate rib members having inner and outer ends, means pivotally connecting said rib members near their inner ends to said rib carrier means, means fixed to said rib carrier means and projecting out through said slot in said shaft for moving said rib carrier means longitudinally in said shaft between a closed position in which said rib carrier means is near the lower end of said shaft and said rib members are in said shaft and an open condition in which said rib carrier means is at the upper end of said shaft and said rib members radiate from said rib carrier means, latch means for releasably securing said rib carrier means in said open and closed positions, locking means on said rib carrier means for retaining said rib members approximately normal to said shaft when in open position, a flexible fabric cover secured at its center to said rib carrier means and at its periphery to outer ends of said rib members, said cover overlying and being supported by said rib members when in open position and being drawn down into said shaft with said rib members when said rib carrier means is moved to closed position.

4,084,601

SPEED CONTROL VALVE FOR A FLUID OPERATED CLUTCH

Harold E. Rowen, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 13, 1976, Ser. No. 731,967
Int. Cl.[2] G05D *13/34*
U.S. Cl. 137—49 **6 Claims**



1. A control valve for a fluid operated clutch or the like, comprising:

a valve body having an inlet and an outlet;

a first valve mounted for reciprocation in said body;

a second valve mounted for reciprocation in said body and relative to said first valve;

one of said valves being concentrically disposed on an end of the other of said valves and having an internal groove;

axial passages in said other valve and opening to said groove to define a throttling port at the interface of said valves and to said inlet and said outlet;

a manual actuator for reciprocally shifting one of said valves; and

a rotatable flyweight assembly for reciprocally shifting the other of said valves.

4,084,602

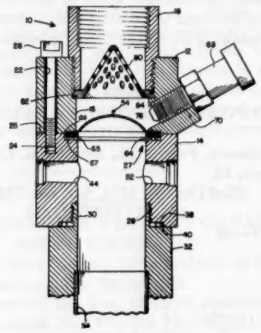
EXPLOSION DISCHARGE VALVE

Kenneth C. Cook, Walnut Creek, Calif., assignor to Systron-Donner Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 637,582, Dec. 4, 1975, Pat. No. 4,046,156. This application Oct. 26, 1976, Ser. No. 735,159
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 A **2 Claims**

1. A valve for discharging pressurized fire extinguisher fluid from a container, including the combination of a valve housing formed with a flow passage, said housing including a valve body adapted for connection with plumbing for distributing the fluid to a remote zone, a manifold body adapted for connection with said container and communicating with the fluid therein, means forming annular flat surfaces on the facing ends of the respective valve body and manifold body to form metal-

to-metal connection at the interface therebetween, means forming an annular recess in said facing end of the manifold body, means forming an annular knife edge in the recess about the passage with the edge pointed toward the valve body, the apex of the edge lying in a plane within the recess and under the plane of the facing end of the manifold body for protecting the knife edge against damage such as during assembly of the valve or during replacement of the diaphragm, a diaphragm in the valve body mounted across the passage for normally occluding flow therethrough, said diaphragm including a peripheral rim which is mounted in the recess, an elastomeric ring disposed in the recess about the knife edge seal with the ring compressed into sealing contact between the diaphragm rim and manifold body when the latter are mounted together by fastener means, and releasable fastener means for mounting the valve body and manifold body together at their interface and for compressing the diaphragm rim into sealing engagement about the knife edge.

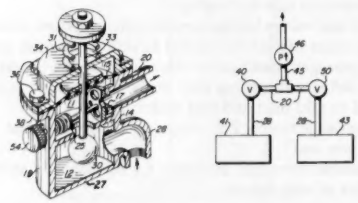


4,084,603

FLUID-BLENDING SYSTEM

Charles W. Howard, San Dimas, Calif., assignor to Early California Industries, Inc., Los Angeles, Calif.

Filed Oct. 18, 1976, Ser. No. 733,439
Int. Cl.² G05D *11/03*
U.S. Cl. 137—88 **10 Claims**



1. A blender for maintaining a pre-established ratio of a plurality of fluids supplied thereto in an output thereof including, in combination:

an output conduit;

at least first and second fluid supply chambers, each having an outlet orifice coupled in common with said output supply conduit, the ratio of the sizes of said outlet orifices establishing the ratio of fluids in the output conduit of the blender, and each of said chambers having an inlet orifice for connection with a supply of fluid;

first and second valve means biased for normally closing said first and second inlet orifices, respectively and capable of opening in various amounts to permit varying amounts of fluid to pass therethrough; and

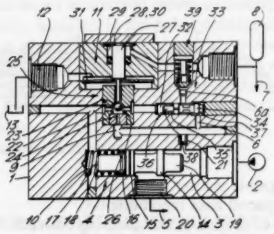
first and second valve control means mounted in said first and second chambers, respectively, said valve control means responsive to fluid demand in said output conduit and coupled with said first and second valve means, respectively, for controlling the amount of opening thereof in accordance with such fluid demand.

4,084,604

PRESSURE RESPONSIVE DISTRIBUTING VALVE

Ludwig Budecker, Frankfurt, and Klaus Winter, Schwalbach, both of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,446
Int. Cl.² G05D *15/00*
U.S. Cl. 137—101 **15 Claims**



1. A pressure responsive distributing valve means for distributing fluid under pressure delivered by a source of fluid pressure from an inlet port portion to outlet port portions for at least first and second user components, through at least first and second lines, one of said user components having an accumulator associated therewith, said distributing valve means including:

a control valve means disposed in said first line connecting said source of fluid pressure with said first user component, said control valve governing the cross-sectional area of the passageway provided by said first line, said control valve including a control chamber and means for reducing the cross-sectional area of the flow of fluid through said first line when said control chamber is in communication with said source through a separate line and for increasing said cross-sectional area when said control chamber is in communication with a return line;

a dual seat pilot and/or stop valve means whose position is dependent upon the pressure at said second user component including pilot valve dual seat closure means in a valve chamber, said pilot and/or stop valve means connecting said source to said control chamber for providing communication through said separate line between said control chamber and said source below a predetermined switching pressure existing at said second user component when said pilot and/or stop valve closure means is in a first position and for connecting said control chamber with said return line when said switching pressure is exceeded and said pilot valve closure means is in a second position; and

means associated with said second line for connecting said source with a second user component when said control chamber is in communication with said return line.

4,084,605

ADDITIVE METERING SYSTEM USING A CENTRIFUGAL PUMP

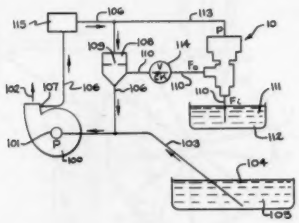
Norman C. Franz, 4665 West Tenth Ave., Vancouver, British Columbia, Canada

Filed Aug. 2, 1976, Ser. No. 711,090
Int. Cl.² G05D *11/00*
U.S. Cl. 137—101.11 **6 Claims**

1. An additive metering system for dispersing a viscous fluid into a less viscous fluid which comprises:

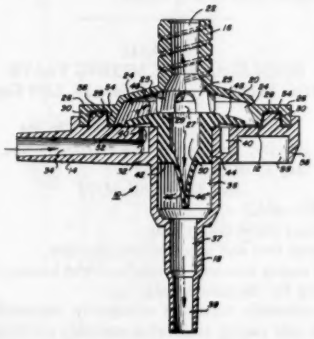
(a) a centrifugal pump having a suction inlet and at least one discharge outlet stage;

(b) a first conduit connected to the suction inlet for intake of a less viscous fluid to which an additive viscous fluid is to be mixed;
(c) a second conduit connected between the suction inlet and an outlet stage of the centrifugal pump;
(d) a venturi mixer with an upstream and downstream side between the venturi provided in the second conduit such that fluid flow is towards the first conduit;
(e) a third conduit connected into the downstream side of the venturi and adapted to draw fluid from a supply of a viscous fluid;



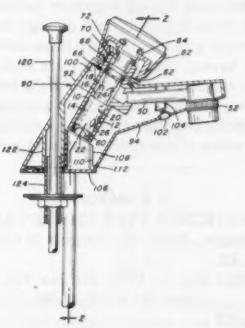
(f) a fluid pressure responsive valve in the third conduit adapted for metering decreasing or increasing amounts of a viscous fluid in inverse relation to the pressure on a fluid pressure responsive means which moves a linearly slideable needle valve having a point taper angle between about 1° and 20° into an orifice for constricting fluid flow through the valve; and
(g) a forth conduit connected between a pump outlet stage and the fluid pressure responsive means in the pressure responsive valve.

4,084,606
FLUID TRANSFER DEVICE
Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 23, 1974, Ser. No. 463,221
Int. Cl. G05d *9/00*
U.S. Cl. 137—102 **7 Claims**



1. A fluid transfer device for the transfer of medical solution which comprises:
a housing including a first inlet for coupling to the medical solution, a second inlet the axis of which is at an angle with respect to the axis of said first inlet for coupling to pump means, and an outlet;
said housing defining a first fluid flow path between said first and second inlets;
said housing defining a second fluid flow path between said second inlet and said outlet;
an umbrella valve comprising a tubular body portion, a resilient normally closed outlet portion and a resilient umbrella portion;
said umbrella valve being interposed in both said first and second flow paths;
said tubular body portion and said resilient outlet portion being located in said second flow path to permit flow under pressure from said second inlet to said outlet but to block flow from said outlet to said first and second inlets, and said resilient umbrella portion being located in said first flow path to permit flow from the first inlet to said second inlet but to block flow from said second inlet to said first inlet;
means for coupling said second inlet to pump means, said coupling means being constructed to space the pump means from said umbrella portion so that contact between said umbrella portion and the pump means is prevented;
said housing having an extending member which rests upon said umbrella portion on the side of said umbrella portion that is toward said second inlet.

4,084,607
LEAKAGE DRAIN FOR SINGLE LEVER CONTROL VALVE
Russell Bruce Fagert, Morgantown, W. Va., and John Louis Fogle, Lanaconing, Md., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 585,941, Jun. 11, 1975, abandoned.
This application May 17, 1976, Ser. No. 686,981
Int. Cl.² F16K *11/02, 51/00*
U.S. Cl. 137—312 **4 Claims**



1. A valve adapted to be mounted on a deck comprising a body having a bore open at least at one end, inlet and outlet ports in said body communicating with said bore, a closure member mounted for movement in said bore between a closed position where flow between said inlet and outlet ports is blocked and an open position where said inlet and outlet ports are in communication with each other, a base member adapted to be mounted on said deck beneath said body, conduit means formed integrally on said base member directly beneath said one end of said bore for conducting fluid leakage between said bore and said closure member away from the vicinity of said one end of said bore.

4,084,608
COCKS HAVING ROTATING VALVES AND SLIDING SEATS
Raymond A. Laignel, Ginestas, and Patrick F. Mommeja, Arles, both of France, assignors to Constructions Metalliques de Provence, Levallois-Perret, France
Filed Jul. 1, 1976, Ser. No. 701,816
Int. Cl.² F16K *43/00*
U.S. Cl. 137—316 **3 Claims**

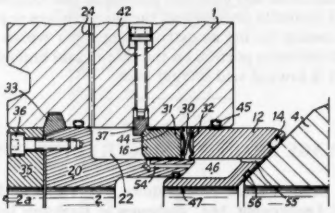
1. A cock having a rotating valve and consisting of:
a body defining a central chamber with cylindrical ducts for

the passage of fluid, each duct having an axis and two opposing ends including a first end opening to the outside of the body and a second end opening into said chamber;

a valve rotating about an axis which is located within said chamber, and through which a bore passes from one end to the other;

annular seats carrying seals co-operating with said valve, each of the said seats being located near the second end of one of said ducts, coaxially therewith, and adapted to slide axially within said duct;

an annular piston associated with each seat, but separate therefrom, said piston being accommodated in an annular space coaxial with said seat and located therebehind, on the opposite side of the valve;



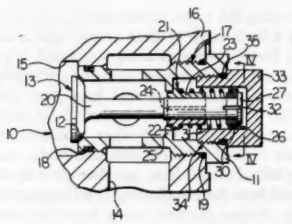
hydraulic means for displacing said pistons axially, including hydraulic means for pushing each of said annular pistons towards the seat with which it is associated, into a position such that the seat is applied to the valve; and mechanical means for locking said annular piston in this position; said body of the cock having a groove formed therein at the periphery of each of said fluid passage ducts; a split ring located in said groove; threaded holes drilled through said body and having two opposed ends including a first end opening at the external periphery of the body and a second end opening into said groove; and a screw in each of said threaded holes bearing against the external surface of said split ring when it is screwed into said hole.

4,084,609

CARTRIDGE TYPE CHECK VALVE

Howard L. Johnson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 17, 1976, Ser. No. 724,145
Int. Cl.² F16K *43/00*
U.S. Cl. 137—327 **11 Claims**



1. A valve comprising

a housing defining a valve seat thereon,

a valve member movably mounted in said housing and normally engaging said seat for blocking fluid flow therepast,

stop means on said valve member,

spring means mounted on said valve member for biasing said valve member into its normal engagement with said seat,

semi-annular retaining means mounted on said valve member and disposed between said stop means and said spring means for retaining said spring means on said valve member, and

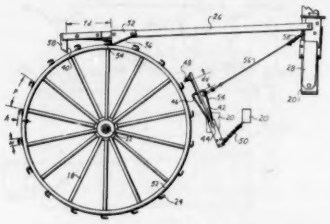
slot means formed through said stop means and in said valve member to expose said spring means whereby insertion of a tool in said slot means will compress said spring means to facilitate installation or removal of said retaining means.

4,084,610

TWO-STEP ROLL AHEAD IRRIGATION SYSTEM

Ralph D. Boone, and Charles Griffin, both of 6020 N. Prince, Clovis, N. Mex. 88101

Filed Oct. 27, 1976, Ser. No. 735,882
Int. Cl.² B05B *3/18*
U.S. Cl. 137—1 **15 Claims**



1. In an agricultural irrigation system having

a. an elongated pipe adapted to carry a plurality of sprinklers and adapted to carry water under pressure,

b. a plurality of vehicles movingly supporting said pipe,

c. at least one drive wheel on each of the vehicles,

d. lugs at a regular pitch on the drive wheel,

e. at least one drive bar on the vehicle,

f. drive means on the vehicle for oscillating the drive bar forward and back,

g. a drive pawl on the bar having a drive face for drivingly engaging said lugs, and

h. a detent drive pawl means mounted on the vehicle for preventing the vehicle from rolling back;

the improved roll ahead structure comprising in combination:

j. a roll ahead pawl on the drive bar having a working face for contacting said lugs spaced from the drive pawl, and

k. a detent roll ahead pawl means mounted on the vehicle for movement toward and away from the lugs for preventing the vehicle from rolling ahead.

4,084,611

SINGLE-HANDLE MIXING VALVE

Francois-Régis Mahrer, Avenue Dumas 14, 1206 Geneva, Switzerland

Filed Nov. 4, 1975, Ser. No. 628,804
Claims priority, application Switzerland, Nov. 4, 1974, 14725/74; May 1, 1975, 5610/75
Int. Cl.² F16K *11/18*
U.S. Cl. 137—454.2 **6 Claims**

1. A mixing valve comprising

a base with first and second fluid passages,

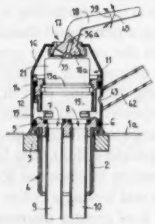
an outer casing mounted on said base and having a discharge opening for the mixed fluid,

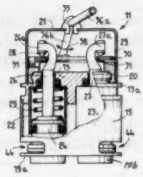
a valve-assembly cartridge removably mounted as a unit within said casing, said valve-assembly cartridge containing first and second valve elements disposed for communication with said first and second fluid passages, respectively, in said base for producing adjustments in the total volume of flow of said fluids from said passages and in the ratio of the volume of flow of one of said fluids to that of the other, said valve-assembly cartridge having an outlet passage communicating with said discharge opening in said casing,

control-means carried by said valve-assembly cartridge for operating said valve elements,

an operating handle independently mounted on said outer casing by means of an articulated coupling formed in part

by an inner facing surface of said outer casing such that the forces due to manipulation of said operating handle are substantially exerted on said outer casing, and





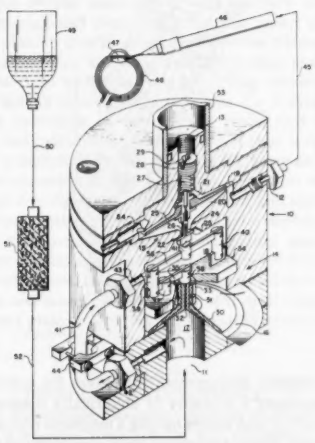
means for removably interconnecting said operating handle and control-means for actuation of said control-means upon manipulation of said operating handle.

4,084,612

FLOW COMPENSATING PRESSURE REGULATOR

Edward F. Baehr, Berea, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 21, 1977, Ser. No. 779,428
Int. Cl.² F16K *17/34*
U.S. Cl. 137—484.2 **17 Claims**



1. A pressure regulator comprising:

a body having an inlet port, an oulet port, an ambient port, and including a first chamber and a second chamber;

a flow sensing diaphragm disposed in said first chamber and forming an inlet subchamber and a flow control subchamber, said diaphragm having therein a signal generating orifice, said inlet subchamber being in communication with said inlet port;

a pressure regulating diaphragm disposed in said second chamber and forming a regulated outlet subchamber and an ambient pressure subchamber, said regulated outlet subchamber being in communication with said outlet port;

flow control valve means disposed between said flow control subchamber and said regulated outlet subchamber;

means operatively connecting said pressure regulation diaphragm to said valve means;

bias means urging said pressure regulating diaphragm into said regulated outlet subchamber and thereby urging said valve means to an open position; and

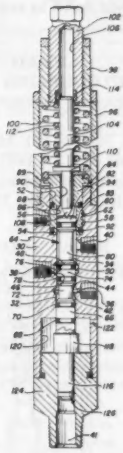
means operatively connecting said flow sensing diaphragm to said valve means, said flow sensing diaphragm urging said valve means to an open position due to pressure drop across said orifice when fluid flows therethrough.

4,084,613

COMBINATION HIGH-LOW PILOT VALVE

Clifford M. Peters, Longview, Tex., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Dec. 13, 1976, Ser. No. 750,296
Int. Cl.² F16K *11/00*
U.S. Cl. 137—596.18 **14 Claims**



1. A pressure responsive pilot valve mechanism for bleeding a pilot controlled fluid pressure system and responsive to the sensing of a predetermined high or low pressure condition in an associated pressurized primary system, said pilot valve mechanism comprising:

a valve body having an elongated bore therein forming a valve chamber with an open end of said bore being in fluid communication with said pressurized primary system, said valve body having an inlet port, an outlet port, and a bleed port in fluid communication with the bore, said outlet port being connected to an outlet fluid line for the fluid pressure system;

a first valve means comprising a main elongated slide valve mounted within said bore for sliding movement and having an end thereof at one end of said bore exposed to fluid pressure from said pressurized primary system; said slide valve movable between a low pressure position permitting fluid communication between said outlet port and said bleed port, a normal operating position permitting fluid communication between said inlet port and said outlet port while blocking fluid communication to said bleed port, and a high pressure position blocking fluid communication from the outlet port to the inlet port;

means continuously urging said slide valve toward the open end of said bore against fluid pressure from said pressurized system;

a secondary valve means comprising a secondary valve member mounted within the bore adjacent the other end

of said slide valve for longitudinal sliding movement relative to said slide valve at least for a portion of its travel, means continuously urging said secondary valve member toward the elongated slide valve;

said slide valve in normal operating position being spaced longitudinally from said secondary valve member and movable longitudinally a limited distance relative to and toward said secondary valve after a predetermined high pressure is reached in said pressurized primary system, said slide valve upon continued movement resulting from the high pressure contacting said secondary valve member and moving with said secondary valve member to said high pressure position; and

a high pressure bleed port in said valve body in fluid communication with said outlet fluid line, said secondary valve member in the low pressure and normal operating positions of said slide valve closing the high pressure port and blocking the bleeding of fluid from the fluid line through the high pressure bleed port, said secondary valve member in said high pressure position opening said high pressure bleed port and permitting fluid from the outlet fluid line to by-pass the outlet port to be bled through the high pressure bleed port when the secondary valve member is moved by the slide valve to said high pressure position.

4,084,614

FLUID COUPLING DEVICE

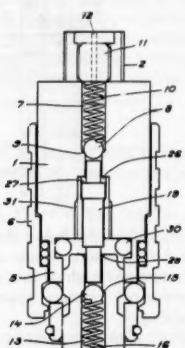
Bror Fridolf Thure Ekman, Slalomvagen 12, 541 00 Skovde, Sweden

Continuation of Ser. No. 624,691, Oct. 22, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,268

Claims priority, application Sweden, Oct. 30, 1974, 7413663

Int. Cl.[2] F16L *37/28*

U.S. Cl. 137—614.03 **3 Claims**



1. Fluid coupling apparatus which is particularly adapted for the detachable connection of fluid pressure responsive equipment to a fluid pressure line at a selected measuring location comprising:

a first coupling part and a second coupling part each defining therein an axial through passage,

a fluid flow blocking element for each said coupling part for at times blocking said through passage in the respective coupling part,

means in each said coupling part for normally urging the respective blocking element into a fluid flow blocking position relative to the corresponding axial passage,

means for releasably engaging said first and second coupling parts with the respective through passages therein being axially aligned in a fluid-tight coupling relationship,

actuating means including a push rod defining therein over at least a portion of its length at least one axial groove and being slidably supported in the axially aligned through passages of said first and second coupling parts,

means including a portion of reduced cross-sectional area at each end of said rod which is axially movable in a mating bore in a corresponding coupling part, each said portion forming a peripheral shoulder which coacts with an abutment in the respective coupling part to limit thereby the extent of insertion of each end of said rod into the corresponding coupling part in accordance with the length of the respective end of said portion of reduced cross-sectional area and thereby also the extent of movement of the corresponding fluid flow blocking element from its blocking position in response to the coupling of said parts,

said push rod having a collar portion over a part of its length which is of greater diameter than that of the remainder of said push rod,

an externally threaded bushing member threadably engaging with one of said coupling parts and having an abutment which cooperates with said collar portion on said push rod to limit the extent of withdrawal of said push rod from said one coupling part, said bushing member defining a sleeve portion to slidingly receive a portion of said push rod to thereby guard against tilting movement of said push rod.

4,084,615

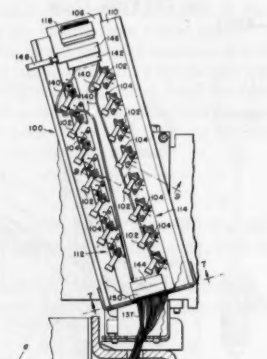
DYEING AND PRINTING OF MATERIALS

Norman E. Klein, Inman, and William H. Stewart, Jr., Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 493,186, Jul. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 430,450, Jan. 3, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,076

Int. Cl.[2] F17D *3/00*

U.S. Cl. 137—624.11 **5 Claims**



1. A compact arrangement for valves for controlling fluid flow comprising a plurality of electrically operated solenoid valves, each of said valves having a magnetic coil and a magnetizable valve element mounted on the magnetic axes of the coil for movement therealong to activate the valve, and means supporting said valves in a compact, closely spaced, three dimensional lattice with the magnetic axis of each of the valves of said theee dimensional lattice being substantially parallel, each plane of said three dimensional lattice including therein at least three valves which are nonlinearly arranged therein, said valves of said three dimensional lattice being further characterized in that valves in one plane of said lattice are positioned intermediate the valves in the adjacent parallel plane of said lattice such that a straight line connecting like points on any of said valves to its nearest neighbor valves, either in a common

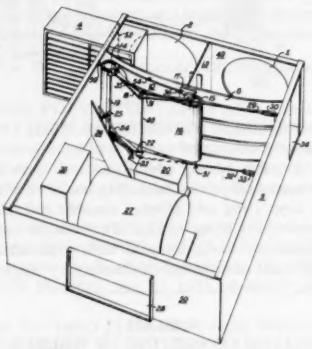
plane or an adjacent plane, forms an angle, with the magnetic axis of such nearest neighbor valve of between 35° to 55° so that the magnetic forces emitted by any nearest neighbor valve crosses the magnetic axes of its nearest neighbor valves at about a right angle.

4,084,616

FLUID PROPORTIONING DEVICE

William Tragert, Rockville, Md., assignor to KTA Corporation, Rockville, Md.

Filed Sep. 30, 1976, Ser. No. 728,326
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.4 **7 Claims**



1. A substantially linearly operating fluid proportioner comprising, an enclosure having a first port therein, and having as a part a curved plate having two mutually exclusive aperture areas in fluid connection with said first port, each of said aperture areas having at least one aperture, a sheet of flexible material, means for mounting said sheet so that at least a part of it is flush against said plate, said at least a part being large enough to completely overlie only one of said aperture areas, and means for moving said sheet while keeping a part of it flush against said plate to overlie selected respective percentages of said two aperture areas and for stopping said sheet at a selected position, said sheet of flexible material being mounted on an assembly which is moved by said means for moving in the direction of curvature of said curved plate, said assembly comprising two cylindrical members and at least a rigid spacing member connecting them, said assembly being mounted so that the axial direction of said cylindrical members is perpendicular to the direction of movement thereof, and said sheet of flexible material being wrapped around said cylindrical members so that two parallel surfaces of said sheet spaced from each other by approximately the outside diameter of said cylindrical members extend in the region between said two cylindrical members, and means for preventing said sheet from moving relative to said plate at a region between said aperture areas.

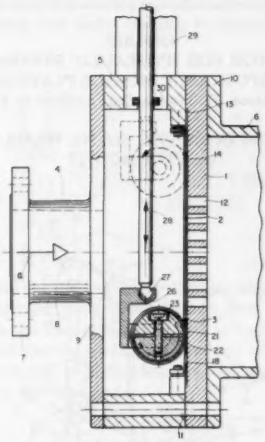
4,084,617

PIPELINE CUTOFF DEVICE

Peter Happe, Eggenstein, Germany, assignor to Johann Baptist Rombach, Karlsruhe, GmbH & Co. KG, Germany

Filed May 17, 1976, Ser. No. 686,689
Claims priority, application Germany, May 17, 1975, 2522084
Int. Cl.² F16K *13/00*
U.S. Cl. 137—625.28 **8 Claims**

1. In a cutoff device for pipelines having a housing, a flexible closure strip which can be unrolled onto a valve seat wall having through-flow openings, part of said strip being secured to said housing, a winding roll for rolling and unrolling said strip, said roll being connected to said strip, and means for reciprocating said winding roll across said openings, the improvement comp rising means in addition to said reciprocating means for applying a rotational torque to said winding roll so as to cause said strip to be wound upon said roll as said roll is reciprocated across said parts, and characterized in that an annular part of the housing is provided over the valve seat



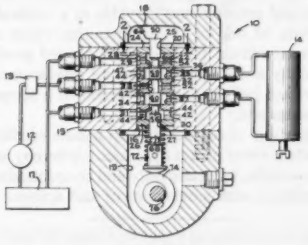
wall, which annular part has fastening means for the closure strip and guide strips are provided which roll on and off the roll in opposition to the closure strip and in that a gasket is seated in a recess of the valve seat wall.

4,084,618

SPOOL VALVE

Raymond A. Gurries, San Jose, Calif., assignor to CMI Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 249,915, May 3, 1972, abandoned. This application Nov. 3, 1975, Ser. No. 628,355
The portion of the term of this patent subsequent to Apr. 18, 1994, has been disclaimed.
Int. Cl.² F15B *13/04*
U.S. Cl. 137—625.48 **8 Claims**



1. A control valve which comprises

a sleeve having a longitudinal bore defined by axially-spaced control and bearing lands and inlet and outlet passages connected to said bore at axially-spaced positions,

a spool member having circumferential grooves separated by control lands and arranged for slidable motion in said sleeve bore to control communication between said inlet and outlet passages,

said spool member also having bearing lands at positions axially separated from said control lands and arranged to slidably support said spool member on adjacent bearing lands in said bore, the diametral clearance between said spool bearing lands and said sleeve bearing lands being slightly less than that between said spool control lands and the adjacent control lands of said sleeve thereby to elimi-

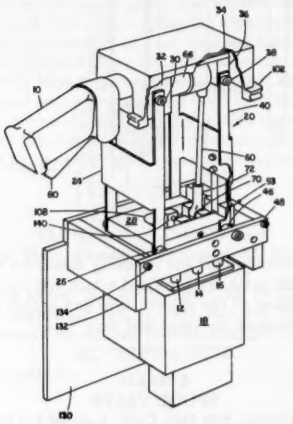
nate contact between said control lands, said clearance difference being so slight as to substantially preclude fluid flow between adjacent surfaces of said control lands of said sleeve and spool.

4,084,619

ACTUATOR FOR HYDRAULIC SYSTEMS IN TRANSPORTABLE MOBILE PLATFORMS

Leonard L. Johnson, Ft. Wayne, Ind., assignor to Teco, Inc., Ft. Wayne, Ind.

Filed Dec. 2, 1976, Ser. No. 746,661
Int. Cl.[2] E04G *1/22*
U.S. Cl. 137—636.2 **6 Claims**



1. A control for regulating the duration and character of connections in a hydraulic system effecting three dimensional movement, comprising: an actuator connected to an actuator linkage having three articulated output connections, a reciprocal valve means one associated with each of the three articulated output connections of said actuator linkage and adapted for individual operation each independently of the others; said actuator linkage comprising a first parallelogram linkage displaceable by said actuator and movable in a vertical plane to effect actuation of one of the independent valve means by displacement movement thereon and a second parallelogram linkage pivotally movable by horizontal displacement of said actuator to effect independent movement of a second one of said valve means and,

means responsive to rotation of said handle to effect a third independent valve means movement, whereby said valves are individually, independently and coordinately actuated in accordance with movements of said actuator.

4,084,620

DIAPHRAGM SPOUT ASSEMBLY

Ernest H. Bucknell, 1700 E. 58th Pl., Los Angeles, Calif. 90058; Jack K. Rauh, 2830 Kiska Ave., Hacienda Heights, Calif. 91745, and Tony Radecki, 1943 Rodney Dr., Apt. 108, Los Angeles, Calif. 90027

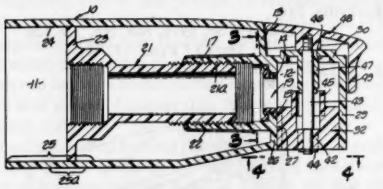
Continuation of Ser. No. 348,641, Apr. 6, 1973, abandoned, which is a division of Ser. No. 186,292, Oct. 4, 1971, Pat. No. 3,739,806. This application Feb. 6, 1975, Ser. No. 547,506
The portion of the term of this patent subsequent to Aug. 18, 1993, has been disclaimed.
Int. Cl.[2] F16L *5/00*
U.S. Cl. 137—801 **4 Claims**

2. A spout assembly comprising:

a body member having a fluid inlet chamber, a fluid outlet chamber and a partition wall integrally formed with said body member and extending inwardly thereof, separating said inlet chamber from said outlet chamber, said partition wall having an aperture therein;

connector means integrally formed with said partition for supplying fluid through said aperture in said partition; and

adaptor means mounted within said inlet chamber for connecting said spout assembly to a plumbing system, said adaptor means including an adapter member having a first end adjustably coupled with said connector means in a



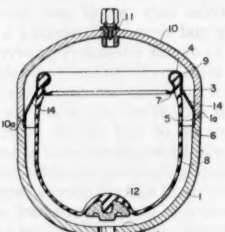
relatively fluid-tight relationship, and having a second end adapted to be coupled with a plumbing system, said adapter member having laterally extending means engaging the inner wall of said inlet chamber of said body member for supporting said adapter member therein, and said adapter member being axially adjustable for enabling the spout assembly to be coupled with a plumbing system through walls of different thicknesses by nipple means.

4,084,621

ACCUMULATOR CONSISTING OF WELDED VESSEL AND LID

Kazuo Sugimura, and Nobuyuki Sugimura, both of 308 Mabase, Shimizu, Shizuoka, Japan

Filed Feb. 11, 1977, Ser. No. 767,752
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—30 **5 Claims**



1. A hydraulic accumulator of the type that comprises a rigid, hollow vessel having its interior divided by a resilient bladder into a gas compartment and a liquid compartment that are sealed from one another, said vessel having a port through which liquid under pressure can flow into and out of said liquid compartment to be maintained under pressure by gas in the gas compartment, said accumulator being characterized by:

A. said vessel comprising a lower bowl-shaped body member and an upper bowl-shaped lid member, which members have their edges sealingly connected with one another;

B. said bladder

1. being bowl-shaped and
2. when in relaxed condition being mostly located in the body member with its concave surface facing upwardly, and
3. having an increased thickness portion all around its edge that defines a circumferential flange; and

C. said bladder being secured in the vessel by means of a securement ring having

1. a large diameter bottom portion that is sealingly received in a radially inwardly opening circumferential recess in the edge portion of the body member,
2. a top portion that is curled radially inwardly and downwardly upon itself all around the ring to define a groove in which said flange is sealingly received, said top portion being of substantially smaller diameter than said bottom portion to support the relaxed bladder completely out of contact with the interior surface of the vessel; and
3. **a medial portion that coaxially connects said top and bottom portions and tapers axially upwardly and radially inwardly from said bottom portion to said top portion to dispose the top portion at a substantial distance above the connected edges of said body and lid members.**

4,084,622

TEXTURED POLYESTER YARNS AND PROCESS FOR THE PRODUCTION THEREOF

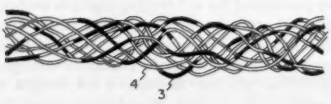
Kiyoshi Nakagawa; Yukio Otaki; Masatoshi Mineo, all of Mishima; Yoshio Aratani, Otsu; Yoshio Tatsuoka, Otsu, and Haruhiko Kusakabe, Otsu, all of Japan, assignors to Toray Industries Inc., Tokyo, Japan

Continuation of Ser. No. 692,137, Jun. 2, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,709

Claims priority, application Japan, Jun. 11, 1975, 50-69585; Jun. 11, 1975, 50-69586; Jun. 11, 1975, 50-69587; Jun. 11, 1975, 50-69588

Int. Cl.[2] D03D *15/10;* **D01D** *5/20;* **D02G** *3/34*

U.S. Cl. 139—420 R **14 Claims**



1. A textured polyester yarn having improved variation in dyeability along its length, comprising a plurality of individual filaments each having thick and thin sections randomly distributed along the filament axis and having an Uster evenness value of 1.0 to 10.0%, a T index of 3 to 30, **a variation in reflected light intensity of** ±0.15 to 0.80 and a broken filament count of not more than 100 per 2,000 m of the yarn length.

8. A woven fabric comprising a textured polyester yarn according to claim **1**, in which the friction coefficient is not more than 1.2 in both warp and weft directions, the ratio of the higher friction coefficient to the lower friction coefficient is not more than 1.5 in both warp and weft directions and the specific volume is not less than 2.0 cm^3/g.

4,084,623

FLUID JET LOOM WITH A YARN WASTE REMOVING APPARATUS

Akio Tojo, Higashi-murayama, and Kimimasa Ohnishi, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 15, 1976, Ser. No. 741,956

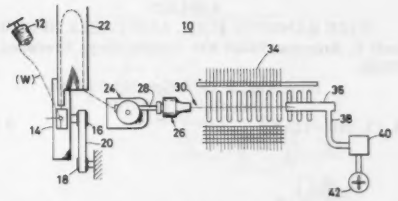
Claims priority, application Japan, Jun. 17, 1976, 51-70369

Int. Cl.[2] D03D *47/30*

U.S. Cl. 139—435 **13 Claims**

1. A fluid jet loom, comprising: grasping means operable to secure a weft yarn passing therethrough;

shooting means for shooting said weft yarn into a shed formed by warp yarns to weave fabrics, said shooting means including a nozzle with a bore fluidly communicable in use with a compressed air supply for producing for each picking action a jet of air inducing a partial vacuum in said bore of the nozzle to cause said weft yarn to be passed through and be ejected from said nozzle; a casing disposed about said grasping means, in which casing yarn waste is collectable, said casing being provided at its generally opposite sides, respectively, with a weft yarn inlet opening and a weft yarn outlet opening, a tube fluidly connecting said outlet opening to said nozzle, whereby



when said shooting means operates to cause said weft yarn to be ejected from said nozzle, a flow of air passing through the casing and said tube toward said nozzle is produced thereby scavenging any yarn waste and miscellanea collected in said casing to shoot same through said shed into the open air.

4,084,624

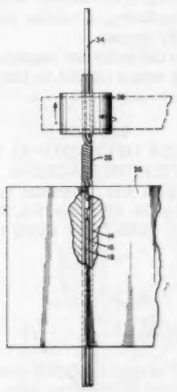
METHOD OF FABRICATING A POT HANGER

Hubert J. Moineau, Bolton, Mass., assignor to Automatic Specialties, Inc., Marlboro, Mass.

Division of Ser. No. 645,808, Dec. 31, 1975. This application Apr. 22, 1977, Ser. No. 789,936

Int. Cl.[2] B21F *15/04, 45/00*

U.S. Cl. 140—80 **10 Claims**



1. A method of manufacturing a hanger for use in supporting planters and the like, which method comprises the steps of:

a. providing a plurality of wire-stringer elements of predetermined length having a straight one end and another end;

b. providing a straight wire-support element having a one end and another end;

c. axially aligning the wire-stringer elements at the one end about the circumference of the wire-support element at the one end of the wire-support element, leaving the other end of the wire-support element free for the forming step (e);

d. twisting tightly the wire-stringer elements about the one end of the straight wire-support element to form a sequentially wrapped, helical coil of the wire-stringer elements about the one end of the straight wire-support element;

e. forming the other end of the straight wire-support ele-

ment, which is free of the twisted helical coil, into a hook-like supporting means; and

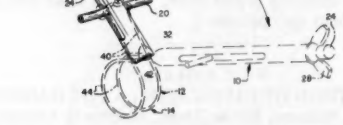
f. forming the other end of the straight wire-stringer elements, while axially aligned with the wire-support element, into securing means adapted to support pot planters and other objects.

4,084,625

WIRE BANDING TOOL AND CABLE SPLICE

Claude E. Brinegar, 18400 SW. Pacific Hwy., Sherwood, Oreg. 97140

Filed Aug. 3, 1976, Ser. No. 711,394
Int. Cl.[2] B21F 9/02
U.S. Cl. 140—123.5 7 Claims



1. In a hose clamp forming tool,

elongated body means entirely of sheet metal of substantially uniform thickness having at least a bottom and two side walls and having a tapered forward end portion with end notches in the two side walls,

a threaded puller lying in and slidable along the body means,

the body means including a tubular portion holding the puller in the body means,

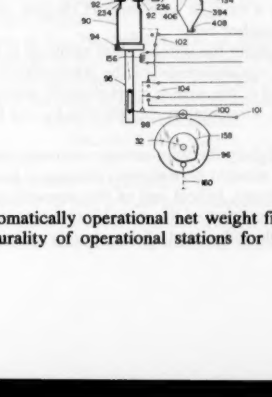
a nut screwed onto the puller and engaging the body means, and wire attaching means carried by the puller.

4,084,626

AUTOMATICALLY OPERATIONAL NET WEIGHT FILLING MACHINE

Alfred T. King, 615 York Ave., Lansdale, Pa. 19446

Filed Nov. 24, 1976, Ser. No. 744,716
Int. Cl.[2] B65B 31/04; G01G 13/34
U.S. Cl. 141—7 21 Claims



1. An automatically operational net weight filling machine having a plurality of operational stations for weighing and dispensing to containers individually net weight amounts of a loose and flowable dry particulate material, said machine comprising in combination an interconnected vertically and horizontally disposed support frame, a motor to drive said machine, a motor control means, a bulk material delivery means vertically disposed respectively at each of said operational stations said bulk material delivery means adapted to supply each of said operational stations with bulk make-up material during operation, a material staging chamber respectively disposed vertically intermediate of said bulk material delivery means and said support frame at each of said operational stations to receive bulk make-up material delivered from said bulk material delivery means thereto and dispense material therefrom for net weight measurement said material staging chambers being each provided with a bulk material delivery control means connected through a material staging chamber bulk material level control circuit to a material staging chamber discharge valve control means whereby a material staging chamber upper material discharge valve is automatically opened and closed to maintain a constant variable range in level of said bulk make-up material in said material staging chambers and a first electro-magnetic vibration means in the proximity of said upper material discharge valve, a means for reciprocating being a reciprocating container platen at each of said operational stations to position and compressively elevate a container automatically delivered by a container delivery means thereto into a container net weight filling position configuration such that a container is engaged with the base thereof upon said reciprocating container platen and the opening thereof being sealed against a container sealing gasket of a vacuum chuck housing of said operational station, a vacuum means and a second electro-magnetic vibration means in the proximity thereof respectively at each of said operational stations said vacuum means operable to provide evacuation of a container positioned for net weight filling at said operational station and said second vibration means being concurrently operable to vibrate said reciprocating container platen during the net weight material filling of a container configured in the net weight filling position thereon, a net weight measuring chamber respectively at each of said operational stations disposed vertically intermediate of said material staging chamber and said container net weight filling position and adapted to receive material dispensed thereto from said material staging chamber and in turn dispense a net weight amount of material therefrom to said container said net weight measuring chamber being pivotally assembled to a counterweighted balance beam such that when a net weight amount of said material as set by an adjustable net weight measuring means assembled upon said balance beam is received into said net weight measuring chamber an integrated electrical sensing circuit is closed by a means to close said circuit thereby simultaneously and automatically activating a first solenoid means operable to close said upper material discharge valve and activate a second solenoid means operable to elevate the counter-balance end of said balance beam about a pivot point and by means of a mechanical linkage assembly set by a fixed adjustable stop said mechanical linkage assembly pivotally connected to said net weight measuring chamber and a net weight measuring chamber lower material discharge valve centrally located within the radial axis opening of a downwardly disposed cone-shaped terminal end of said net weight measuring chamber to thereby cooperatively open said lower material discharge valve and move said net weight measuring chamber vertically downward sharply to an impact point said impact point being a resilient impact gasket supported by said vacuum chuck housing of said operational station to thereby cause a quick dispensing of the net weight amount of material from said net weight measuring chamber into said container during evacuation and vibration thereof, an integrated control circuit means to activate and control said first and second electro-magnetic vibration means, a plurality of rotating cam means fixedly assembled in a regularly repeating longitudinally spaced relationship upon a main drive shaft rotatably driven by said motor to respectively cycle said reciprocating container platens to withdraw a filled container from

and deliver an empty container to said filling position and deliver said filled container to a discharge conveyor, a main drive shaft electric clutch and brake means to control a container infeed conveyor and the transport movement thereof to create a pause in said movement until said net weight amount of said material is dispensed to said net weight measuring chamber, and a plurality of rotating recycle cams fixedly assembled upon said main drive shaft in a regularly repeating longitudinally spaced relationship thereto respectively for each of said operational stations to rotatably engage and close an operational station integrated control circuit recycle switch and also thereby in turn respectively recycle said operational stations of said automatically operational net weight filling machine for continued automatic container net weight filling operations.

4,084,627

METHOD OF AND APPARATUS FOR DISPENSING TOBACCO PORTIONS

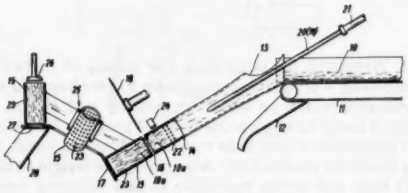
Heinz Focke, and Oskar Balmer, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Aller, Germany

Filed May 1, 1974, Ser. No. 465,944

Claims priority, application Germany, May 5, 1973, 2322736

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—11 **11 Claims**



1. In a process for dispensing individual uniform portions of fibrous tobacco material or the like, including the steps of supplying continuously said material as a fleece or web, forming a strand of uniform density, separating said strand into individual portions in a measuring chamber corresponding to the volume of one portion, the improvement wherein the step of forming said strand of fibrous material of uniform density comprises directing an air flow onto said web in the conveying direction of said web towards said measuring chamber and confining the broken up fibrous material downstream of the point of contact of the air flow with the fibrous material web to cause separated material fibers to back up at uniform density.

4,084,628

CONVEYOR APPARATUS FOR DELIVERING FLUX POWDER TO THE MOLD OF A CONTINUOUS CASTING INSTALLATION

Markus Schmid, Zurich, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Nov. 11, 1976, Ser. No. 740,926

Claims priority, application Switzerland, Nov. 27, 1975, 15396/75

Int. Cl.[2] B65B *3/10*

U.S. Cl. 141—284 **12 Claims**

1. A conveyor apparatus for delivering flux powder to the molten bath level of a mold of a continuous casting installation for metals, especially steel, comprising:

a supply container for flux powder;

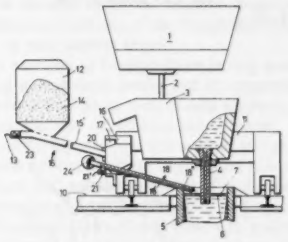
a container for receiving the flux powder from said supply container;

said supply container possessing a larger capacity for flux powder than said receiving container;

said supply container being located externally of the direct servicing region of the mold;

said receiving container being located at the neighborhood of the mold;

pneumatic conveyor means interposed between said supply container and said receiving container for delivering by



means of a pneumatic conveying agent flux powder from the supply container to said receiving container; and

mechanical conveyor means for delivering the flux powder from said receiving container at the neighborhood of the mold to a region above the molten bath level in said mold.

4,084,629

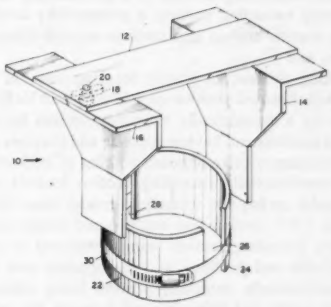
ROUTER CLAMP

George E. Kreusler, 22441 Alpine Way, Palm Springs, Calif. 92262

Filed Oct. 26, 1976, Ser. No. 735,608

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—134 D **4 Claims**



1. A router clamp for attachment to a router having a housing, the router clamp including in combination a bridge plate member, a pair of inverted L-shaped brackets each bracket having an upper and lower portion, a substantially cylindrical collar and a compression band

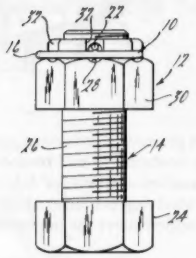
said bridge plate member being affixed to each upper portion of the pair of brackets, one of said brackets being adjustably and removably affixed to said bridge plate member by means of a slot, bolt and nut; the slot being disposed in the upper portion of said removably affixed bracket;

said substantially cylindrical collar comprising two half sections, each half section being affixed to the lower portion of each of the pair of brackets, so as to define two longitudinal collar openings which allow the half sections to be compressible inwardly so as to contact and hold the housing of the router when the router is positioned therein and when the compression band is tightened over the longitudinal openings on the periphery of the collar to assist concentric gripping action of the half sections.

4,084,630
LOCKING RING FOR A CASTELLATED NUT

Frederick M. Lewis, 741 Lincoln Rd., Grosse Pointe, Mich. 48230

Filed Jun. 11, 1976, Ser. No. 695,167
Int. Cl.[2] F16B *39/04*
U.S. Cl. 151—5 1 Claim



1. A fastener assembly including a castellated nut threadably connected to a bolt having a diametrically extending aperture, said nut having a plurality of radially extending notches and an annular peripheral recess formed at one end thereof, said recess being defined by a substantially radially outwardly extending portion, a substantially axially extending portion and an intermediate arcuate connecting portion, and

a locking element for fixedly securing said nut at a preselected threaded position on said bolt, said locking element having a diametrically extending section located within said aperture and having opposite end portions engageable with diametrically opposed notches of said nut,

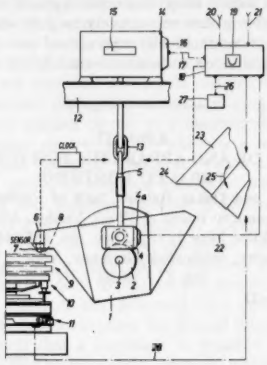
a circumferentially extending section located within said annular recess and extending greater than 180° and less than 270+ around said nut, one end of said circumferentially extending section being connected to one of said opposite end portions, and the opposite end of said circumferentially extending section being retained within said recess and being located between the periphery of said recess and the other of said end portions, with the terminus of said opposite end of said circumferentially extending section comprising a first radially inwardly extending locking tab portion disposed within one of the notches located on the diametrially opposite side of said nut from the major portion of said circumferentially extending section of said locking element, the terminus end of said diametrically extending portion extending radially outwardly from said axial portion of said recess and located on the axially opposite side of said annular recess and serving to retain said circumferentially extending section from said radially outwardly extending portion of said recess so as to overlie said circumferentially extending section and thereby serve to maintain said circumferentially extending section engaged with said radial portion of said recess, and

a second radially inwardly extending locking tab portion formed on said circumferentially extending section symmetrically of said first locking tab portion and disposed within one of the other of said notches.

4,084,631
METHOD AND DEVICE FOR CONTROLLING A CASTING MACHINE

Konrad Kunzmann, Rollinghausen, Germany, assignor to Alfelder Machinen-und Modellfabrik Kunkel, Wagner & Co. KG, Alfeld, Leine, Germany

Filed Jun. 26, 1975, Ser. No. 590,634
Claims priority, application Germany, Jun. 27, 1974, 2430835
Int. Cl.[2] B22C *19/04;* B22D *37/00*
U.S. Cl. 164—4 12 Claims

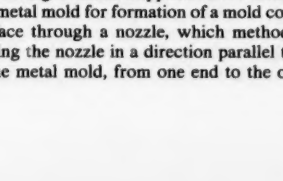


1. Apparatus for controlling the casting of molten metal comprising a pivotable casting ladle for holding said molten metal and having an outlet for pouring said molten metal, control means having a predetermined program for controlling the inclination of said ladle to pour said molten metal, weighing means for continuously determining the weight of metal in said ladle and means responsive to said weighing means for modifying said predetermined program to cause said control means to vary the inclination of said ladle to maintain a constant head of metal above said outlet and including means for determining at least one parameter indicative of the end of a casting cycle and means for arresting the inclination of said ladle to stop the pouring of molten metal.

4,084,632
APPLICATOR NOZZLE FOR USE IN CENTRIFUGAL CASTING

Hiroshi Izaki, Osaka, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 8, 1976, Ser. No. 664,892
Int. Cl.[2] B22C *3/00;* B22D *13/10*
U.S. Cl. 164—72 4 Claims



1. A method for applying a coating solution onto a molding surface of a metal mold in a centrifugal casting operation wherein the coating solution is applied onto a molding surface of a rotating metal mold for formation of a mold coating on the molding surface through a nozzle, which method comprises linearly moving the nozzle in a direction parallel to the rotating axis of the metal mold, from one end to the other end of

said metal mold which is being rotated, while discharging the coating solution from a plurality of nozzle openings formed in said nozzle for forming the mold coating on the molding surface as the nozzle moves in said linear direction into the metal mold, said nozzle openings being at a predetermined pitch to each other such that the pitch between the nozzle openings is given by the equation:

$$P = (6000/NXY) \text{ (cm)}$$

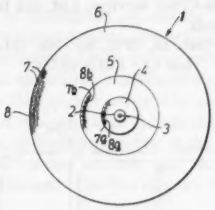
wherein P is the pitch between the nozzle openings, N is the number of revolutions of the metal mold in r.p.m., X is the number of nozzle openings and Y is the moving speed of the lance in sec./m. by which relationship a uniform coating can be applied without any spiral patterns on the surface of the metal mold.

4,084,633

ROTOR FOR ROTARY HEAT EXCHANGERS

Ove Magnus Strindehag, Jonkoping, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Nov. 2, 1976, Ser. No. 737,506
Claims priority, application Sweden, Nov. 12, 1975, 7512674
Int. Cl.² F28D *19/00*
U.S. Cl. 165—8 **7 Claims**



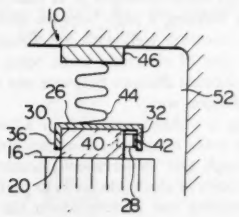
1. A rotor for heat exchangers, substantially for heat exchange between two airstreams, where the rotor is assembled of a plurality of circumferential layers of corrugated foil, characterized in that the foil in the inner layers closest to the rotor center has a higher mechanical strength than the foil in the outer layers close to the rotor periphery, said foil in said inner layers is of greater thickness than the foil in the outer layers.

4,084,634

SEAL ASSEMBLY FOR ROTARY DISC-TYPE MATRIX OF GAS TURBINE ENGINE

Noritoshi Handa, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Sep. 15, 1976, Ser. No. 723,638
Claims priority, application Japan, Sep. 22, 1975, 50-113708
Int. Cl.² F28D *19/00*
U.S. Cl. 165—9 **10 Claims**



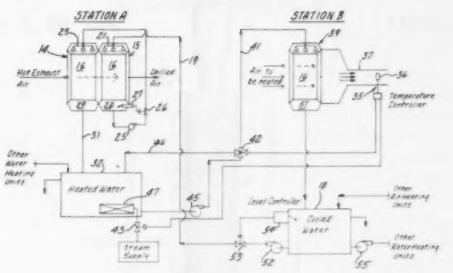
6. A regenerative heat-exchanger comprising:
a housing;
a rotary disc-type matrix rotatable within a housing with sectors of said matrix being subjected to gas streams of differing pressures;
a support having a groove, said groove having a bottom wall, a first side wall and a second side wall, said bottom wall, said first side wall and said second wall cooperating to define said groove;
a plurality of friction shoes received in said groove and placed one after another;
each of said friction shoes having two longitudinal ends, each contacting with one of the longitudinal ends of adjacent one of said friction shoes;
each of said plurality of friction shoes having a side adapted for sliding against said matrix and an opposite side contacting with said bottom wall of said support;
each of said plurality of friction shoes having a first side surface contacting said first side wall of said groove and a second side surface opposite to said first side surface and spaced from said second side wall of said groove;
bellow means located on said housing and said support to urge said support toward said matrix to maintain sliding contact of said plurality of friction shoes against said matrix; and
a plurality, corresponding in number to said plurality of friction shoes, of spring means, each disposed between said second side wall of said groove and the second side surface of the corresponding one of said plurality of friction shoes, for biasing said plurality of friction shoes toward said first side wall of said groove, respectively, to urge said plurality of friction shoes into contact with said first side wall of said groove.

4,084,635

HEAT RECOVERY AND HEAT DISTRIBUTING APPARATUS

Hugh G. Marshall, Como, Canada, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Aug. 18, 1976, Ser. No. 715,396
Int. Cl.² F28D *15/00*
U.S. Cl. 165—107 **12 Claims**



1. Freeze-resistant heat-recovery apparatus comprising:
an aqueous medium;
a first, or gas-to-liquid, waste-heat reclaiming, heat exchanger having an endothermic liquid-conducting portion providing an upper inflow means and a lower outflow means;
a second, or liquid-to-fluid heat-distributing heat exchanger in remote relation with the first heat exchanger having an exothermic liquid-conducting portion provided with an inflow means and an outflow means; and first duct means connecting the inflow means of the first heat exchanger to the outflow means of the second heat exchanger, and second duct means connecting the outflow means of the first heat exchanger to the inflow of the second heat exchanger;
said liquid-conducting portion of said first heat exchanger comprising:
an assembly of vertically-extending horizontally-spaced generally-rectangular sheets arranged in generally parallel planes of which each is indented or embossed substantially over its entire area to provide concavo-

convex non-planate portions in said sheets in assembled closely-spaced relationship for causing any fluid passing therebetween to be subjected to turbulence;

said sheets having lateral side edges at opposite lateral extremities, and top and bottom edges;

said sheets being joined together in horizontally successive pairs of which each successive pair of sheets has its top edges joined and its bottom edges joined to provide a horizontal passageway;

the side edges of adjacent mutually-facing sheets adjacent pairs of top-and-bottom joined sheets being joined at opposite lateral extremities to provide a vertical passageway between each of adjacent pairs of top-and-bottom joined sheets;

closure means at four corners of the assembly connecting with the sheets to close off intercommunication of the vertical passageways with the horizontal passageways;

said inflow means of the first heat exchanger comprising shower means supported over the upper entrances of all of said vertical passageways;

liquid supply means and regulating means therefor limiting the supply of said liquid to said shower means to a rate of avoiding any standing liquid head in said vertical passageways;

header means for enclosing the entrances of said horizontal passageways at one side of said assembly; and

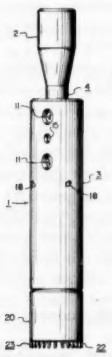
means for supplying air or other gas to said header means.

4,084,636

HYDRAULIC JUNK RETRIEVER

Edward V. Burge, 14800 Memorial, Apt. 241, Houston, Tex. 77079

Filed Aug. 26, 1976, Ser. No. 717,981
Int. Cl.[2] E21B *31/06*
U.S. Cl. 166—65 M **9 Claims**



1. A hydraulic junk retriever for well bore holes including

a tubular mandrel adapted to be secured to the lower end of a tubular drill stem for lowering to the bottom of a well bore and having its bore communicating with the interior of the drill stem,

an elongate cylindrical housing depending from the mandrel and having a tubular portion below its upper end to provide a downwardly opening cylindrical barrel of relatively large internal diameter,

means rotatably connecting the housing to said mandrel,

flow passage means in the upper end portion of said housing communicating with the bore of said mandrel and having at least one port extending from its lower end portion laterally outward through the wall of said housing at a tangent to its axis of rotation, whereby drilling fluid under pressure supplied to the flow passage means is discharged tangentially by its port into the well bore so as to impart rotation to said housing and centrifugal force to the discharged drilling fluid,

elongated upright vane means within the barrel of said housing for creating a vortex therein upon rotation of said housing so as to draw debris from the bottom of the well bore through the downwardly opening lower end of said barrel,

means within said barrel above its lower end for trapping large debris therein, and

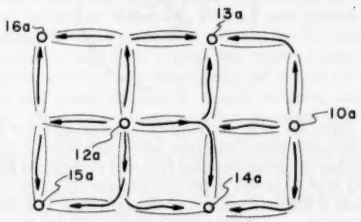
fluid passage means in said upper end portion of said housing above the discharge port therein establishing communication between the upper end of said barrel and said well bore to permit upward reverse circulation of said drilling fluid through said barrel.

4,084,637

METHOD OF PRODUCING VISCOUS MATERIALS FROM SUBTERRANEAN FORMATIONS

John C. Todd, Dallas, Tex., assignor to Petro Canada Exploration Inc.; Canada-Cities Services, Ltd. and Imperial Oil Limited, all of, Canada

Filed Dec. 16, 1976, Ser. No. 751,058
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—245 **9 Claims**



1. A method of producing a viscous material from a subterranean formation which comprises:

(a) drilling and completing a plurality of at least two wells from the surface into said subterranean formation for production of said viscous material therefrom; at least one of said wells being completed as an injection well and at least one of said wells being completed as a production well, said wells being spaced apart and arranged in a predetermined pattern;

(b) drilling and completing a plurality of spaced-apart electrode wells into said subterranean formation, said electrode wells being arranged in at least one line, said line generally defining a path between said production well and said injection well with the distance between each adjacent pair of electrode wells being substantially less than the shortest distance between said injection well and said production well;

(c) applying a voltage across each adjacent pair of said electrode wells to thereby cause an electrical current to pass through said subterranean formation between said adjacent pairs of electrode wells to preheat said subterranean formation and thereby lower the viscosity of said viscous material along said path formed by said line of electrode wells;

(d) thereafter injecting a fluid through said injection well and into said subterranean formation to migrate along said path formed by said line of electrode wells; and

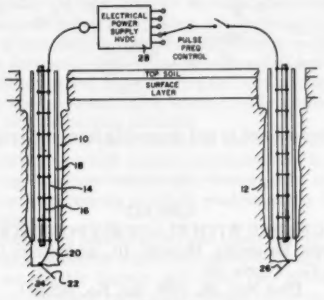
(e) producing said viscous material, having a reduced viscosity from said production well.

4,084,638

METHOD OF PRODUCTION STIMULATION AND ENHANCED RECOVERY OF OIL

Cuthbert R. Whiting, Saddle River, N.J., assignor to Probe, Incorporated, Saddle River, N.J.

Filed Oct. 16, 1975, Ser. No. 623,098
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—248 **28 Claims**



1. A method of production stimulation and enhanced oil recovery from existing oil wells, comprising the steps of:

(a) disposing an insulated high voltage cable within an injection well and embedding a conductive probe at the end of said cable within an oil-bearing stratum;

(b) disposing an insulating high voltage cable within a recovery well and embedding a probe at the end of said cable within an oil-bearing stratum, said recovery well being between 25 feet and 3,000 feet distance from said injection well;

(c) connecting a high energy charging and discharge circuit, at the surface level, between each of said cables associated with said injection and recovery wells;

(d) applying a voltage, current, frequency and pulse width control circuit to said charging and discharge circuit; and

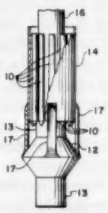
(e) selectively actuating the above circuitry in order to produce sequential high energy electrical impulses originating at the electrode embedded within the injection well, thereby producing electrical, thermal, physical and sonic shock effects sufficient to produce geological fracturing and, thereby, oil flow between said electrodes.

4,084,639

ELECTRODE WELL FOR ELECTRICALLY HEATING A SUBTERRANEAN FORMATION

John C. Todd, Dallas, Tex., assignor to Petro Canada Exploration Inc.; Canada-Cities Services, Ltd. and Imperial Oil Limited, all of, Canada

Filed Dec. 16, 1976, Ser. No. 751,057
Int. Cl.[2] E21B *43/25*
U.S. Cl. 166—248 **6 Claims**



5. An improved method for passing an electrical current through a subterranean formation comprising the steps of:

(a) drilling a well bore into said formation;

(b) securing a deflector means to the lower end of an outer, elongated, cylindrical casing;

(c) placing a plurality of elongated, rod-like members having upper and lower ends vertically inside said outer, elongated, cylindrical casing;

(d) placing a smaller diameter inner pipe string concentrically within said outer, elongated cylindrical casing whereby said plurality of elongated rod-like members are positioned in the annular space between the interior of said outer elongated cylindrical casing and said inner pipe string, said inner pipe string having an annular ram collar affixed to the outer surfaces of said inner pipe string, said ram collar being sized to allow vertical movement of said inner pipe string within said outer, elongated, cylindrical casing;

(e) positioning said outer, elongated, cylindrical casing, containing said plurality of said elongated rod-like members and said inner pipe string into said well bore adjacent said subterranean formation;

(f) moving said inner pipe string downwardly whereby said annular ram collar engages the upper ends of said elongated, rod-like members to thereby force the lower ends of said elongated, rod-like members downwardly into contact with said deflector means to cause said rod-like members to be forced outwardly into said subterranean formation; and

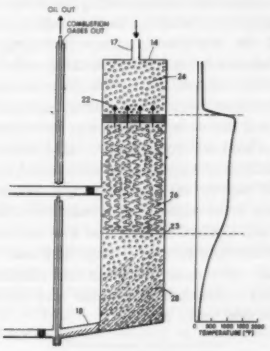
(g) establishing an electrical current through said rod-like members whereby said electrical current passes through said formation.

4,084,640

COMBINED COMBUSTION FOR IN-SITU RETORTING OF OIL SHALES

Victor Dean Allred, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 4, 1976, Ser. No. 738,928
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—259 **8 Claims**



1. A method of recovering shale oil from an underground oil shale formation comprising the steps of:

(a) rubblizing a zone and forming an oxidant injection means and shale oil recovery means in an oil shale formation,

(b) igniting the rubblized zone substantially across the entire zone at an intermediate point between the ends of the zone to create a combustion front in the rubblized zone,

(c) injecting an oxidant containing gas into rubblized zone to move a combustion heat front progressively toward the oxidant injection means while driving a heat front and educed hydrocarbon behind the combustion front, established substantially across the entire rubblized zone, toward a recovery means,

(d) continuing to inject the oxident containing gas through the rubblized zone after the combustion front reaches the

injection means so that the combustion front reverses itself and progressivly moves back toward the recovery means driving the educed hydrocarbons and the heat front progressively toward the recovery means, and

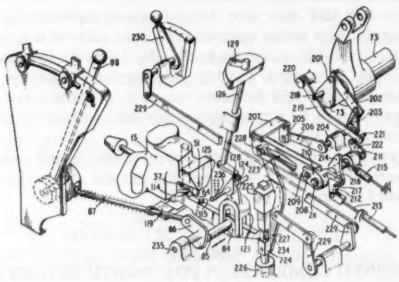
(e) removing the educed hydrocarbons from the recovery means.

4,084,641

CONTROL FOR A TRACTOR POWER LIFT MECHANISM

Herbert Edward Ashfield, and Harry Horsfall, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Feb. 9, 1976, Ser. No. 656,196
Int. Cl.[2] A01B *63/112*
U.S. Cl. 172—9 **11 Claims**



1. Control means for a tractor power lift mechanism comprising a movably mounted first member, height control means for automatically moving said first member in response to variations in the height relative to the tractor of an implement hitched to said tractor, a movably mounted second member, draft control means for automatically moving said second member in response to variations in the draft force exerted by the tractor on the implement, means including a movably mounted first balance lever interconnecting said first and second members, a first manually operable lever, a control linkage connected between said first balance lever and said first manually operable lever and comprising means for varying the point of connection of said control linkage to said lever whereby to vary the proportions of height and draft control, control valve means for said power lift mechanism, a second movably mounted balance lever adjustably connected to said first balance lever by said control linkage and also operatively interconnected between said control linkage and said valve means for actuating said valve means, and a second manually operable lever operatively connected to actuate said second balance lever to operate said valve means.

4,084,642

TURF PERFORATING MACHINE

Marvin L. Killion, 510 Pontiac Dr., Gretna, Nebr. 68028

Filed Jul. 13, 1976, Ser. No. 705,722
Int. Cl.[2] A01B *45/02*
U.S. Cl. 172—21 **8 Claims**

1. A turf perforating machine comprising:

a wheeled frame;

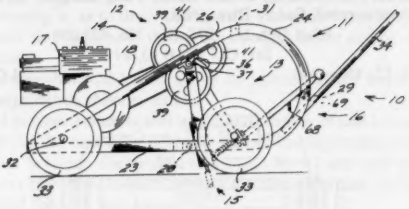
a laterally disposed shaft rotatably mounted on said frame;

power means mounted on said frame and operably connected to said shaft;

a guide device pivotally connected to said shaft and depending therefrom;

an eccentric unit secured to said shaft;

a reciprocating unit slidably disposed in said guide device and having one end connected to said eccentric unit and having the other end depending from said guide unit; and



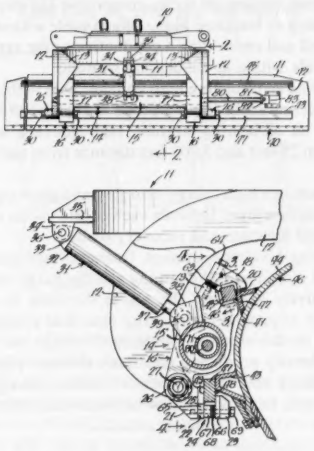
a tool unit secured to and depending from said reciprocating unit.

4,084,643

MOTOR GRADER WITH BLADE SUPPORT STRUCTURE

Gene Baptist Easterling, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 26, 1976, Ser. No. 745,507
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—795 **25 Claims**



1. In a motor grader which has a circle with a pair of integral, depending, parallel blade support arms at its rearward portion, an improved support means for mounting a grader blade assembly on said arms for endwise movement, said improved support means comprising, in combination:

a bearing housing structure comprising a pair of generally upright bearing housings and a transverse structural member which has one of said bearing housings integrally secured thereto at each of its ends, said entire bearing housing structure being slightly shorter than the space between the support arms and being devoid of any portions positioned laterally outwardly of said arms, and said bearing housings having open upper jaws and open lower jaws extending entirely across them, said bearing housing structure further being devoid of any portions integrally attached thereto which extend laterally outwardly of and also around said arms;

aligned transverse pivot means in the lower ends of said support arms which engage the bearing housings below said structural member to support said housing structure between said support arms and predominantly forward of the arms;

facing bearing means surrounding said pivot means between

said arms and said bearing housings so the bearing housing structure reinforces the arms against lateral deflection;

and substantially parallel upper and lower rails on the rear of the blade assembly which extend through said open jaws and are slidable therein, said jaws and rails having slidably interengaging surfaces to retain the rails in the jaws.

18. In a motor grader which has a circle with a pair of integral, depending, parallel blade support arms at its rearward portion, an improved support means for mounting a grader blade assembly on said arms for endwise movement, said improved support means comprising, in combination:

a pair of generally upright bearing housings each of which has a forwardly open upper jaw extending entirely across it with lower and upper bearing surfaces, and an upwardly open lower jaw extending across it with parallel front and rear internal bearing surfaces;

aligned transverse pivot means in the lower ends of said support arms which impale complementary holes in said bearing housings behind said lower jaws to pivotally support said bearing housings predominantly forward of the arms;

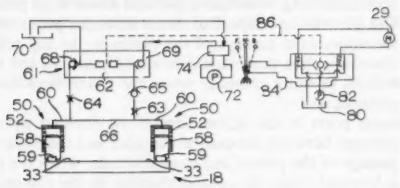
and substantially parallel upper and lower rails on the rear of the blade assembly which extend through said open jaws and are slidable therein, said upper rails having surfaces slidably engaging the bearing surfaces in the upper jaws to support the blade assembly on said bearing housings, and said lower rails making a close sliding fit between said front and rear internal bearing surfaces and being otherwise free of contact with the bearing housings at all times, whereby the blade assembly is supported solely by the upper jaws and is only restrained against fore-and-aft movement by the lower jaws.

4,084,644

MOTOR GRADER OR THE LIKE WITH HYDRAULIC CONTROL SYSTEM FOR CIRCLE GEAR

Carroll R. Cole, Decatur; Joseph E. Dezelan, Western Springs, and Gene B. Easterling, Decatur, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 17, 1976, Ser. No. 724,204
Int. Cl.² E02F 3/76
U.S. Cl. 172—796 **10 Claims**



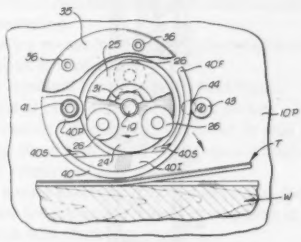
1. In a motor grader or the like including a main frame supported on wheels, a drawbar frame, a working implement carried by a circle gear and a power source; said drawbar frame being adjustably mounted on said main frame, said circle gear comprising an annular body having parallel upper and lower planar surfaces and inner and outer peripheral surfaces, and said working implement being carried by said circle gear adjacent said lower surface thereof; said drawbar frame including guide shoes slidably engaging said lower surface of said circle gear and supporting said circle gear with said upper surface of said circle gear adjacent said drawbar frame for rotation of said circle gear about the axis thereof, and said power source including drive means operably connected to said circle gear for selective rotation of said circle gear and said working implement carried thereby; the improvement comprising hydraulic ram means mounted on said drawbar frame including single acting piston means in continuous engagement with said upper surface of said circle gear and a hydraulic control system powered by pump means driven by said power source and supplied by a fluid reservoir, said hydraulic control system comprising means to apply a given hydraulic pressure to said hydraulic ram means to force said piston means against said upper surface of said circle gear when said circle gear is being rotated by said drive means and means within said hydraulic control system and spaced from said pump means to trap hydraulic fluid within said hydraulic ram means to continue to apply hydraulic pressure to said hydraulic ram means to cause said piston means to rigidly oppose movement of said lower surface of said circle gear away from said engagement with said guide shoes when said circle gear is not being rotated by said drive means.

4,084,645

APPARATUS FOR SECURING T-EDGING AND SIMILAR EDGING BANDS

Saverio Salamone, Sun City, Ariz., assignor to Evans Rotork, Inc., Glendale, Ariz.

Filed Dec. 9, 1976, Ser. No. 748,824
Int. Cl.² B23Q 5/027
U.S. Cl. 173—13 **17 Claims**



1. A hammer comprising

a substantially semicircular flapper element pivotable about a point adjacent one end thereof and swingable about the pivot point upon receiving an impacting force at a preselected location thereof to thereby swingably produce a hammering action on a workpiece, the flapper element having a partial cylindrical configuration and is arranged in a vertical orientation, said flapper element including a long-wearing impact area defined on the inside cylindrical surface thereof at a preselected location for receiving the impacts from said impacting means, and

means for continuously producing an intermittent impacting force on the flapper element at said preselected location upon the flapper element being moved into engagement therewith and only during the time intervals the flapper element is maintained in engagement with said means at said preselected location,

said impacting means comprising three hammer impacting elements arranged in a triangular relationship for successively impacting the hammer at the impact area.

4,084,646

FLUID ACTUATED IMPACT TOOL

Ewald Heinz Kurt, Phillipsburg, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 19, 1976, Ser. No. 659,425
Int. Cl.² H01B 17/54
U.S. Cl. 173—17 **30 Claims**

1. A percussive drill apparatus of the valveless type adapted for downhole drilling comprising:

a casing;

a backhead disposed at one end of said casing adapted to connect the drill apparatus to a drill string and a source of pressure fluid;

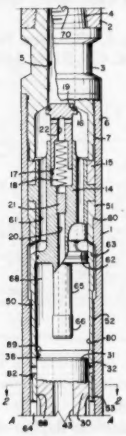
a distributor disposed within said casing towards said one end of said casing;

a percussive member disposed at the other end of said casing to form a chamber having one end disposed towards said distributor and a second end disposed towards said percussive member between said distributor and said percussive member within said casing;

a cylinder sleeve disposed in said chamber toward said one end of said chamber;

a first pressure fluid passage formed between said casing and said cylinder sleeve to connect the pressure fluid source to said chamber;

a piston disposed in said chamber to reciprocate axially therein and impart a blow on said percussive member; said piston is in sliding contact with said cylinder sleeve adjacent said one end of said chamber and in sliding contact with said casing adjacent said second end of said chamber;



a means for continuously applying pressure fluid to a selected portion of said one side of said piston to thereby provide a continued driving force on said piston towards said second end of the chamber;

a means for alternately supplying and exhausting pressure fluid to a selected portion of one side of said piston disposed towards said one end of said chamber and to a selected portion of the other side of said piston disposed towards said second end of said chamber to thereby reciprocate said piston; and

said means for alternately supplying and exhausting pressure fluid to said one side of said piston includes a second pressure fluid passage extending from said first pressure fluid passage along the interior of said sleeve and the exterior of said piston.

4,084,647

PNEUMATIC PERCUSSION HAMMER

William Lister, 36 Rabaul St., Moorooka, Queensland, Australia

Filed Jun. 30, 1976, Ser. No. 701,181

Claims priority, application Australia, Jul. 1, 1976, PC2183

Int. Cl.[2] B25D *17/14;* E21C *7/02*

U.S. Cl. 173—73 **2 Claims**

1. A pneumatic percussion hammer for rock drilling including:

a tubular housing,

a top sub connected to the top of the housing, adapted to be connected to, and to receive air under pressure from, a drill rod,

a cylindrical air feed tube extending from the top sub coaxially into the housing, said tube being formed with holes adjacent the bottom thereof, said tube apart from said holes serving no valving function;

a bit having a shank mounted for limited slidable movement in the lower end of the housing,

an anvil on the bit shank,

a bit air passage through the anvil, shank and bit,

a sliding seal tube extending axially into the housing from the bit air passage,

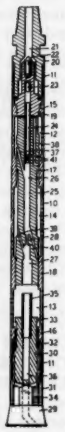
a piston reciprocally slidable in the housing and adapted to strike the anvil on its down-stroke,

a top pressure chamber in the housing about and above the top of the piston,

a bottom chamber in the housing about and below the piston,

a central pressure chamber in the housing about an intermediate part of the piston,

an upper cylindrical, axial passage in the piston, said passage being slidably engaged with the air feed tube,



a lower axial passage in the piston adapted, when the piston is on its down-stroke, to engage slidably with the sliding seal tube,

pressure ports extending through the walls of said piston and communicating with said upper and lower axial passages, said ports being adapted to direct air under pressure from the upper axial passage of the piston to the top pressure chamber when the piston is in raised position, and to the bottom pressure chamber when the piston is in lowered position, and

exhaust ports in the piston adapted to conduct air under pressure between the central chamber and the lower axial passage of the piston, and to conduct air, when the piston is lowered, from the central chamber to the top pressure chamber.

4,084,648

PROCESS FOR THE HIGH-PRESSURE GROUTING WITHIN THE EARTH AND APPARATUS ADAPTED FOR CARRYING OUT SAME

Teruo Yahiro, Tokyo, and Hiroshi Yoshida, Tokorozawa, both of Japan, assignors to Kajima Corporation and Chemical Grout Company, Limited, both of Tokyo, Japan

Continuation-in-part of Ser. No. 666,280, Mar. 12, 1976, Pat. No. 4,047,580, which is a continuation of Ser. No. 523,647, Nov. 13, 1974, abandoned. This application Feb. 11, 1977, Ser. No. 768,251

Claims priority, application Japan, Feb. 12, 1976, 51-13296

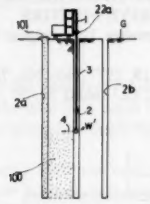
Int. Cl.[2] E21B *7/18, 33/138;* E02D *3/12*

U.S. Cl. 175—67 **7 Claims**

1. Process for the formation of an underground cemented earth mass, comprising the steps of injecting a combined and concentric liquid-and-gas jet laterally from a gradually elevating first point within the earth for fluidically penetrating there-

into and cutting thereof, and grouting continuously from a second point with a cement milk separately from said jet and at a lower level than the latter for solidifying a mixture of the cut and crushed earth with the said liquid gradually from below, said second point being elevated gradually and concurrently with said first point.

6. Apparatus for the formation of an underground cemented structure wherein a concentric triple-walled pipe rod proper is fitted at its upper end with a swivel and supply assembly adapted for receiving separately compressed air, pressure liquid and pressurized cement milk and for being vertically



movably and rotatably suspended, and at its lower end with a working head comprising a laterally directing and concentrically arranged double jet nozzle, having a core nozzle element and an outer ring nozzle element, said core nozzle element being adapted for injecting a liquid core jet containing no earth-solidifying agent and at a high velocity at least equal to a half the sonic one and the outer ring nozzle element being adapted for injecting a ring gas jet enveloping said liquid core jet, and said working head is provided with cement milk discharge means positioned at a lower level than the said double jet nozzle.

4,084,649

ROCK BIT

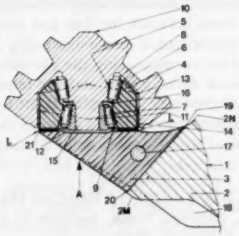
Hans Bertil van Nederveen, Bosch en Duin, Netherlands, assignor to SKF Industrial Trading & Development Company B.V., Jutphaas, Netherlands

Filed Jun. 7, 1976, Ser. No. 693,508

Claims priority, application Netherlands, Jun. 20, 1975, 7507355

Int. Cl.² E21B *9/08*

U.S. Cl. 175—366 **14 Claims**



1. In a rock bit for drilling holes in the earth's crust, wherein rotatable cutting elements are journalled in supports, the supports being adapted to be coupled to rock bit driving means; the improvement wherein said supports are comprised of a base portion having a recess and a removable portion removably held by said base portion, said cutting elements being journalled in said removable portion, said removable portion having the shape of a solid prism and being removably fitted to said base portion in said recess with all of the edges of the prism lying in planes generally defined by the outer surfaces of said base portion outside of said recess.

4,084,650

SPRING BALANCE

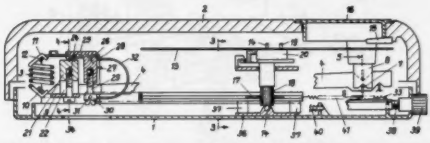
Paul Terraillon, Monnetier-Mornex, France, assignor to Terraillon, Annemasse, France

Filed Jun. 10, 1976, Ser. No. 694,682

Claims priority, application Switzerland, Sep. 10, 1975, 11733/75

Int. Cl.² G01G *23/14*

U.S. Cl. 177—174 **8 Claims**



1. A weighing scale of the type disclosed comprising a support frame, a weighing platform movably mounted with respect to said support frame, and a weighing mechanism interconnected between said frame and said platform, said weighing mechanism including:

a. an indicating means for indicating the weight of an object placed upon said platform,
b. a pinion mounted for rotation on said frame,
c. an elongated rack in mesh with said pinion,
d. said indicating means being connected to said pinion for indicating the weight of an object upon actuation of said rack and rotation of said pinion,
e. a weigh spring interconnected between said platform and said frame for spring movement in response to an object place upon said platform,
f. a fulcrum,
g. a lever interconnected between said weigh spring and said rack and pivoted on said fulcrum,
h. one end of said lever also being pivoted to said rack,
i. said lever being arranged substantially perpendicular to the direction of travel of the rack when said rack is in its zero position,
j. means for adjusting the indicating means to zero when the rack is in its zero position and the platform is not loaded,
k. the length of said lever between said fulcrum and the pivot point of said lever on said rack being adjustable in length for affecting calibration of the weighing mechanism under a known predetermined load, and
l. adjustment of the length of said lever to calibrate the mechanism as aforesaid being without any substantial effect upon the zero adjustment of said indicating means.

4,084,651

LIQUID-ACTUATED WEIGHING APPARATUS

Jean Henri Lagneau, 30, route du Vallon Sainte-Gemme-Moronval, 28105 Vernouillet, France

Filed Sep. 27, 1976, Ser. No. 727,219

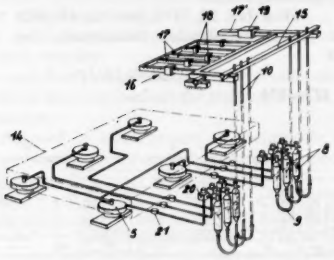
Claims priority, application France, Oct. 3, 1975, 75 30305

Int. Cl.² G01G *1/30, 1/26, 5/04*

U.S. Cl. 177—192 **10 Claims**

1. A weighing apparatus comprising:
a closed compressible chamber of variable volume;
a reservoir having a lower end;
a conduit interconnecting said chamber and said reservoir;
a first liquid filling said conduit and said chamber.
an upright tube having an upper end open to the atmosphere and a lower end;
a flexible conduit connecting said lower ends together;

a second liquid filling said flexible conduit, at least part of said reservoir, and at least part of said upright tube; and



means for weighing the mass of said second liquid displaced in said tube on compression of said closed chamber.

4,084,652

WEIGHING APPARATUS

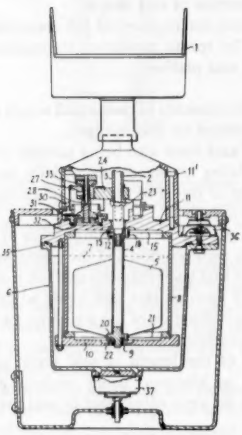
Charles Edward Arthur Sharp-Dent, and John Owen Hounsell, both of Uxbridge, England, assignors to Wright Machinery Company Limited, Uxbridge, England

Filed May 3, 1976, Ser. No. 682,460

Claims priority, application United Kingdom, May 2, 1975, 18582/75

Int. Cl.[2] G01G *5/02*

U.S. Cl. 177—207 **2 Claims**



1. Weighing apparatus comprising:

a. a frame;

b. a receptacle for receiving material to be weighed;

c. a stem secured to the receptacle;

d. suspension means secured to the stem so that the stem can move substantially vertically with respect to the frame under an applied load; the suspension means comprising two spider members each consisting of a body having a circular rim portion and a plurality of resilient spokes extending generally inwardly to a hub, the hubs of the spider members being secured to the stem at positions spaced axially along the stem, and the rim portions being secured to the frame such that the stem can move resiliently in the vertical direction but that lateral and torsional movement thereof are substantially prevented;

e. measuring means mounted on the frame and operative to give an electrical output signal varying in accordance with vertical movement of the stem;

f. a chamber defining a space for housing a liquid medium, and a float located within the chamber, the stem being connected to said float, said float being submerged throughout its normal range of movement so as to give fixed buoyancy irrespective of vertical movement;

g. said chamber comprising a main float chamber, an inner chamber disposed coaxially within the main float chamber, an opening defined in the wall of the inner chamber through which the liquid medium can pass from the main float chamber to the interior of the inner chamber; and

h. a plurality of vibration damping devices which interconnect the main float chamber to an outer casing.

4,084,653

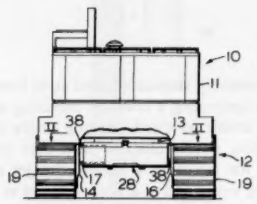
PROTECTIVE GUARD ARRANGEMENT FOR TRACK DRIVE MOTORS

Charles G. Boen, Montgomery, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 19, 1977, Ser. No. 788,873

Int. Cl.[2] B62D *55/00*

U.S. Cl. 180—9.48 **4 Claims**



1. In a crawler type vehicle of the type movable along a longitudinal axis and having a car body, a pair of roller frames connected to the opposed sides of the car body, and a pair of drive motors each being connected to a respective roller frame and each having proximal and distal end portions, each of said roller frames being movable between a first position at which the roller frame and associated drive motor are at a minimum distance from the longitudinal axis and a second position at which the roller frame and associated drive motor are at a maximum distance from the longitudinal axis, the improvement comprising:

a first guard assembly connected to said car body and being of a construction sufficient for substantially encompassing said drive motors at the first position of the roller frames and for encompassing at least the distal end portions of the drive motors at the second position of the roller frames; and

a pair of second guard assemblies each mounted on a respective roller frame and movable therewith during movement of the roller frame between the first and second positions, each of said second guard assemblies being of a construction sufficient for encompassing the proximal end portion of the associated drive motor and for telescopically extending into the first guard assembly at the first position of the roller frame.

4,084,654

PARTIALLY FLUID LACKED VEHICLE DRIVE TRAIN

Harold M. Dudek, Bellevue, Wash., assignor to Astro Development Corporation, Seattle, Wash.

Filed Sep. 30, 1976, Ser. No. 728,307

Int. Cl.[2] B60K *17/16*

U.S. Cl. 180—44 R **10 Claims**

1. A partially fluid locked gear drive train for a transfer case or differential or the like comprising:

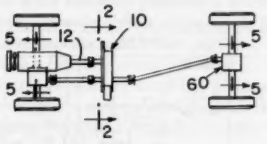
an outer fluid tight housing,

an inner housing,

a planetary gear train within said inner housing, said gear train including a sun gear, a plurality of planet gears and an internal ring gear, all said gears lying in a common plane,

plate means positioned on opposite sides of said gears in

close abutting relation thereto and closely surrounding the peripheries of the gears, said plate means including coaxially aligned fluid inlet and outlet ports, the location of said ports being also aligned with teeth of said gears but spaced around the periphery of the gears a distance from a from



a point of mesh between two meshing gears whereby fluid is carried by the gear to a point of mesh for partial fluid lock and is also passed through the gear teeth for cooling, and

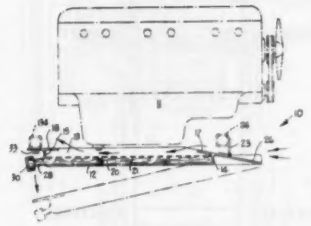
means for delivering fluid into said inner housing and maintaining the inner housing in a generally filled condition.

4,084,655

MOTOR VEHICLES

Emil Savron, 468 Morphett Road, Warradale, Australia (5046)

Filed Aug. 10, 1976, Ser. No. 713,100
Claims priority, application Australia, Aug. 15, 1975, 2802/75
Int. Cl.² B62D *25/20*
U.S. Cl. 180—69.1 **3 Claims**



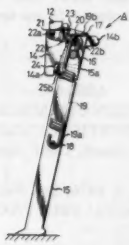
1. Apparatus for collecting and retaining liquid exudant such as oil as dripped from an internal combustion engine of a vehicle, the arrangement being characterized in that there is a tray, including a floor and upturned sides and a rear portion, adapted to be supported by being secured to the vehicle in a position below the engine, the position of the tray relative to the motor vehicle being such as to encourage air flow between the engine sump and the tray during forward movement of the motor vehicle, the tray being adapted to retain the liquid exudant by reason of the upturned sides, a porous pad within the tray extending over the floor of the tray, means retaining said pad in such position within the tray, hinge means secured to a front portion of the tray to secure the tray to a vehicle below the engine to mount the tray pivotally for movement between a horizontal drip catching position and a downwardly extending draining position, an outlet means at a rear portion of the tray for draining liquid collecting in the tray, and removable means to secure the rear portion of the tray to a vehicle to position the tray substantially horizontally.

4,084,656

MOTORCYCLE STAND WITH SAFETY SWITCH

Masaki Itoh, Akashi, and Yorio Yamasaki, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1977, Ser. No. 789,679
Claims priority, application Japan, May 1, 1976, 51-50508
Int. Cl.² B60K *28/00*
U.S. Cl. 180—103 R **14 Claims**



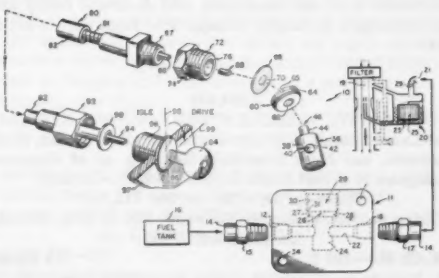
1. A device for preventing the starting of a two-wheeled motorcycle having a source of potential, an engine ignition circuit, an engine starting circuit and a stand, for motorcycles of the type comprising a stand assembly including a stand adapted to be brought to a forwardly inclined operative position for supporting the motorcycle when the latter is stationary, to automatically move to a neutral position when the motorcycle is brought to an upright position and to be moved to an inoperative position by the driver when the motorcycle runs, said device comprising, in combination, a stand switch connected in series between said ignition circuit and said source of potential; and means included in said stand assembly and operable to effect closure of said stand switch, when said stand is in either its operative position or its inoperative position, and to effect opening of said stand switch when said stand is in its neutral position.

4,084,657

METHOD AND APPARATUS FOR PREVENTING THEFT OF IDLING VEHICLES

W. L. Bradley, 64 Ford St., Ansonia, Conn. 06401; Bennie W. Frye, 70 Evelyn St., Stratford, Conn. 06497, and Joseph W. Raines, 686 Platt St., Bridgeport, Conn. 06606

Continuation-in-part of Ser. No. 166,067, Jul. 26, 1971, abandoned. This application Feb. 28, 1974, Ser. No. 446,772
Int. Cl.² B60R *25/04*
U.S. Cl. 180—114 **9 Claims**



1. Apparatus for preventing the theft of a vehicle having an engine utilizing first and second fuel components, said engine incorporating a fuel tank for storing the first fuel component and a carburetor for mixing the first and second fuel components, said carburetor having a fuel chamber for storing a small quantity of said first fuel; comprising:

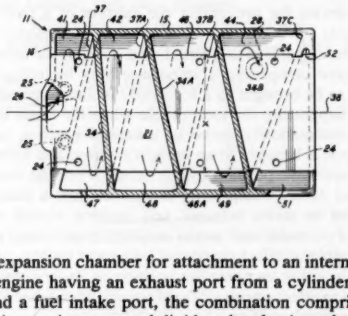
A. a valve interposed between the fuel tank and the fuel chamber of the carburetor having:
(a) a first position permitting full flow of said first fuel component to said chamber; and
(b) a second position permitting restricted flow of said first fuel component to said chamber; and
B. a lock communicating with the valve for controlling the movement of the valve between its first and second positions; whereby the engine is fully operable when the valve is placed in its first, full flow position, and is restricted to continuous idling and short time duration full loading when the valve is placed in its second, restricted flow position.

4,084,658

TUNABLE EXPANSION CHAMBER FOR INTERNAL COMBUSTION ENGINES

Milo E. Murphy, Long Beach, Calif., assignor to Custom-Bilt, Seal Beach, Calif.

Filed Nov. 5, 1976, Ser. No. 739,196
Int. Cl.[2] F01N *1/00*
U.S. Cl. 181—241 **13 Claims**



1. An expansion chamber for attachment to an internal combustion engine having an exhaust port from a cylinder with a piston and a fuel intake port, the combination comprising an outer casing, an inner central divider plate having a longitudinal axis, a first plurality of longitudinal spaced diverters extending between plate and casing on one side of the plate, a second plurality of diverters extending between plate and casing on the other side of the plate, the diverters of one plurality sloping with respect to the longitudinal axis oppositely to the diverters of the other plurality, said plate being narrower than the interior of said casing such that an exchange opening is defined between pairs of diverters between casing and plate edge, an exhaust input port at one end of said casing connecting to the volume between adjacent diverters and said plate, and an exhaust outlet port in said casing connecting to the volume between adjacent diverters and said plate at a casing end remote from said input port, said diverters, casing and plate defining a continuous passage from input port to outlet port.

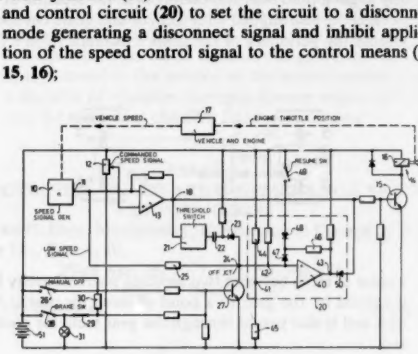
4,084,659

AUTOMOTIVE VEHICLE SPEED CONTROL SYSTEM

Karl-Ludwig Abend, Schwieberdingen; Bernhard Mattes, Sachsenheim, and Hans Scheyhing, Leonberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 10, 1976, Ser. No. 722,210
Claims priority, application Germany, Oct. 4, 1975, 2544454
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—105 E **8 Claims**

1. Vehicle speed control system comprising means (**13**) to generate a speed command signal;
control means (**14, 15, 16**) to control the engine of the vehicle in accordance with a speed control output signal;
a disconnect signal memory and control circuit (**20**) connected to control application of the speed control signal to the control means (**114, 15, 16**) and including an electronic amplifier (**40**) having a self-holding feedback connection (**46, 47**),
an OFF junction (**24**) connected to the disconnect memory and control circuit (**20**) to set the circuit to a disconnect mode generating a disconnect signal and inhibit application of the speed control signal to the control means (**14, 15, 16**);



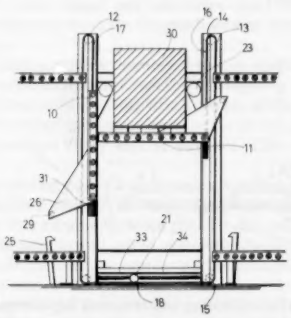
and a "resume" signal generating switch (**49**) connected to the self holding feedback connection (**46, 47**) of the amplifier (**40**) to disable application of the feedback signal from the output (**43**) of the amplifier to its input (**42**) and reset the amplifier to permit transfer of the speed control signal to the control means (**14, 15, 16**).

4,084,660

LIFTING DEVICE FOR MOVING GOODS BETWEEN DIFFERENT LEVELS

Leif Per Roland Anderson, Bogatan 39 A, S- 412 72 Goteborg, Sweden

Filed Feb. 4, 1977, Ser. No. 765,644
Int. Cl.[2] B66B *11/04*
U.S. Cl. 187—26 **1 Claim**



1. Lifting device for the transfer of goods from a first level to a second level, comprising driving means, a frame having two guides, two platforms movable along said guides, pivoting means for supporting each platform on a respective guide and permitting each platform to be pivoted between a first position extending from its respective guide wherein it can carry goods and a second position adjacent to its respective guide, said guides being located relative to each other such that said platforms have substantially the same path of movement when being moved along said guides, power transmission means between said driving means and said platforms having for each platform an elongated flexible traction element, one end of which is attached to said frame and the other end to the respective platform, said traction element extending in a loop over a pulley, said pulley being operably connected to said driving means and actuated thereby to perform a reciprocating movement, the respective ends of the two traction elements attached

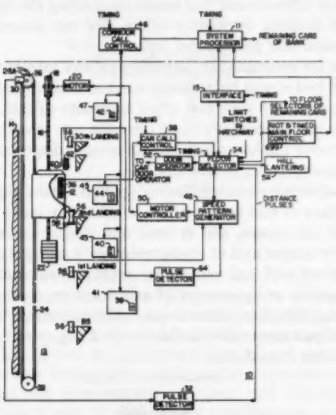
to the respective platforms extending in opposite directions along the guides, whereby the platforms are moved in a synchronous displacing movement in opposite directions relative to each other in the path of movement along their respective guides when pulleys are displaced by means of the driving means, and means for pivoting said platforms between said positions whereby one of said platforms will be pivoted to said second position when the other platform is in the first position and moving in the opposite direction to provide free passage in the path of movement for said other platform, said pivoting means comprising a catching means provided to catch a part of said one platform at a distance from the pivoting axis of said one platform to impart a turning movement thereto when said axis is moved along the respective guide together with said one platform.

4,084,661

ELEVATOR SYSTEM

Wing C. Quan, Waldwick, N.J.; David M. Edison, Murrysville, Pa.; George T. Hummert, Oakmont, Pa., and Milton Sackin, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1974, Ser. No. 467,700
Int. Cl.[2] B66B *1/20*
U.S. Cl. 187—29 R **20 Claims**



1. In an elevator system, a method of providing predetermined lobby functions at a selectable floor of a building, comprising the steps of:

providing a plurality of elevator cars,

providing status signals responsive to said elevator cars,

providing means for registering requests for elevator service,

providing a system processor including a memory responsive to the status signals and requests for elevator service for providing signals for controlling movement of the elevator cars,

providing software instructions for the memory which select a floor of the building as a special floor,

detecting the desirability of switching the selected special floor to a different floor,

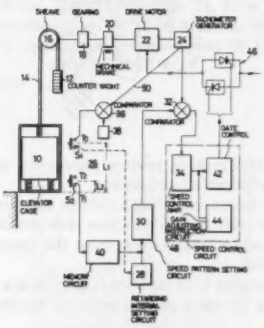
and changing the specified special floor in the software instructions to a different floor responsive to the detecting step.

4,084,662

CONTROL APPARATUS FOR AN ELEVATOR SYSTEM

Minoru Tezuka, Yokohama, and Yastami Kito, Tokyo, both of Japan, assignors to Nippon Otis Elevator Company and Kabushiki Kaisha Meidensha, both of Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,815
Claims priority, application Japan, Sep. 1, 1975, 50-120473; Sep. 1, 1975, 50-120474
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **4 Claims**



1. A control apparatus for an elevator system in which rotational speed of a drive motor for driving said elevator system is controlled by supplying a deviation signal obtained by comparing a speed signal of said drive motor including an induction motor with a driving pattern setting signal, said control apparatus comprising: a retardation time interval setting circuit for setting a retardation time interval for retarding the speed of said drive motor, a speed pattern setting circuit beginning operation depending on a signal from said retardation time interval setting circuit and for setting a retarding pattern of said elevator, a speed pattern correcting circuit storing a deviation signal obtained by comparing a signal corresponding to an output signal of said speed pattern setting circuit with a reference speed setting signal of a reference speed setting circuit and applying said deviation signal to said speed pattern setting circuit for correcting said speed pattern, a comparator circuit for generating a deviation signal between said output signal of said speed pattern setting circuit and the signal proportional to said rotational speed of the drive motor, and a speed control circuit for amplifying and controlling said deviation signal and for supplying said amplified and controlled deviation signal to said drive motor as a control signal, said speed control circuit comprising a control amplifier circuit for controlling and amplifying said deviation signal of said comparator circuit, a gate control circuit for controlling a voltage to be applied to said drive motor in response to an output signal of said comparator circuit, and a gain adjusting instruction circuit for supplying a bias to said control amplifier circuit in changing said drive motor from a powering state to a retarding state thereof.

4,084,663

AUTOMATIC BRAKE FOR WHEELED CARRIAGES

Frederick Haley, 819 Stevens St., Lowell, Mass. 01851

Filed Aug. 30, 1976, Ser. No. 718,539
Int. Cl.[2] B62B *5/04*; B60T *1/06*
U.S. Cl. 188—31 **10 Claims**

9. In combination

a manually propelled vehicle having front and rear wheels with spaced, radial spokes and a push bar handle at the upper rear of said vehicle,

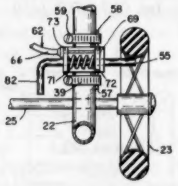
an automatic locking device attachable on said vehicle without structural change thereof and comprising:

an elongated bracket having a brake rod longitudinally

slidable therein, with a brake locking portion extending outwardly therefrom;

means for detachably clamping said bracket on said vehicle with the locking portion of said rod in the space between adjacent spokes of one of said front wheels,

set screw slide means on said rod, and a coil spring encircling said rod, within said bracket, for normally spring



biasing said locking portion outwardly under predetermined, adjustable compression;

finger grip means, including a slidable member connected by a flexible cable to said set screw slide means for retracting said wheel locking portion from the space between said spokes and

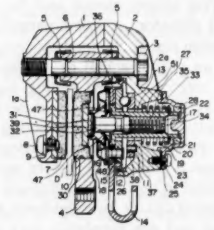
means associated with said finger grip means for detachably clamping the same on said push bar handle.

4,084,664

DISC BRAKE

Tetsuo Haraikawa, Funabashi, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Feb. 15, 1977, Ser. No. 768,905
Claims priority, application Japan, Feb. 20, 1976, 51-17797
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—71.9 **5 Claims**



1. In a disc brake:

a rotatable disc to be braked;

fixed support means;

friction pad means having a friction side for engaging a portion of one side of said disc when the brake is operated and an opposite side to which a substantially linear force may be applied for operating the brake,

said pad means being shiftably carried by said support means for substantially linear movement thereof between a normal disposition in which said friction side is in adjacent facing relationship to said portion of said disc and a braking disposition in which said friction side is in forceful braking engagement with said portion of said disc;

housing means carried by said support means and including a leg portion spaced from said opposite side of said pad means in a direction away from said disc,

said leg portion including wall structure defining an opening therethrough disposed in alignment with said pad means and said portion of said disc;

tubular nut means having an axis, an internally threaded axial body portion extending through said opening, an out-turned flange portion adjacent one extremity of said body portion disposed between said pad means and marginal parts of said leg portion around the extremity of said opening proximate said pad means, ratchet teeth means on the side of said flange portion facing said pad means, and an external surface adjacent the other extremity of said body portion remote from said pad means;

operating lever means pivotally mounted on said nut means for rotational movement about said axis of the latter;

means for mounting said nut means on said leg portion for rotation of said nut means about said axis thereof and for substantially linear movement of said nut means along said axis toward and away from said pad means,

said mounting means including spring means operably intercoupled with said leg portion and said nut means for yieldably biasing the latter in a direction away from said pad means, and guide means for maintaining said axis of said nut means substantially centered with respect to said opening;

motion conversion means, including ramp means carried by said lever means and disposed between said flange portion of said nut means and said marginal parts of said leg portion for shifting said lever means and thereby said nut means substantially linearly along said axis toward said pad means when said lever means is turned in one rotational direction thereof;

push rod means adjustably carried by said nut means and having an externally threaded portion adjacent one extremity thereof threadably received in said body portion, and a stretch, including a portion of polygonal transverse cross-section, extending from said threaded portion along said axis toward and into proximity with said opposite side of said pad means for engagement of the latter by the other extremity of said rod means to apply a substantially linear force to said pad means for shifting the latter into its said braking disposition when said nut means is shifted toward said pad means; and

means for automatically adjusting for any substantial wear of said pad means by rotating said rod means relative to said nut means to shift said other extremity of said rod means into engagement with said opposite side of said pad means to move the latter into its said normal disposition relative to said portion of said disc,

said adjusting means including friction means engaging said surface of said body portion to yieldably resist rotation of said nut means, and at least one tongue carried by said lever means and in engagement with said polygonal portion of said rod means for rotating said rod means in response to movement of said lever means in one rotational direction thereof until said rod means has moved said pad means into initial forceful engagement with said portion of said disc.

4,084,665

DISC BRAKE AND MOUNTING MEANS THEREFOR

Richard Thomas Burnett, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 22, 1976, Ser. No. 734,908
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **9 Claims**

1. A disc brake comprising:

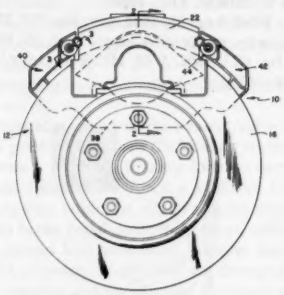
a rotor rotating with an axle assembly and having friction faces on opposite sides thereof;

a caliper cooperating with a pair of friction elements to urge the pair of friction elements into engagement with the friction faces on said rotor to retard the rotation of said rotor;

a torque member secured to a nonrotating portion of the axle assembly, said caliper and said torque member having substantially matching slots; and

a pair of pins disposed within said matching slots between said torque member and said caliper, each of said pair of pins having a recess within said matching slots for receiv-

ing an elastomeric ring, which ring resiliently engages said torque member slot and said caliper slot to dispose each of



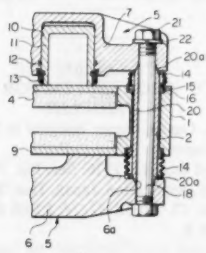
said pair of pins in spaced relation to said torque member and said caliper in a brake-release position.

4,084,666

DISC BRAKE CALIPER MOUNTING

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Feb. 7, 1977, Ser. No. 766,506
Claims priority, application Japan, Feb. 12, 1976, 51-15358
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **2 Claims**



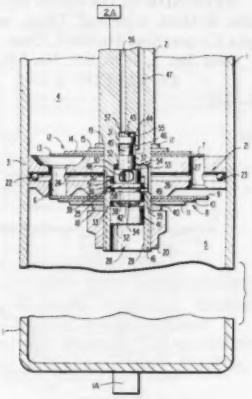
1. A disc brake comprising a rotatable disc, a non-rotatable member having a portion straddling a portion of the outer periphery of the rotatable disc, a pair of brake pads disposed on the opposite sides of the disc and slidably supported in said non-rotatable member for movement toward and away from the disc, a caliper having two caliper parts on opposite sides of said disc and said non-rotatable member, said non-rotatable member having a pair of guide bores therethrough, a pair of bolts spaced circumferentially of said disc and connected between said caliper parts through said guide bores for securing said caliper parts to each other, a sleeve surrounding the shank portion of each of the bolts and extending between the caliper parts through said guide bores, said caliper parts having bolt receiving holes therein having portions facing said non-rotatable part with a diverging enlarged shape, the opposite ends of each of said sleeves having a shape complementary to the diverging enlarged shape and being tightly seated in the diverging enlarged shape portions of said bolt receiving holes with part of said complementary shaped portions outside of said diverging enlarged shape portions of said bolt receiving holes, said part of said complementary shaped portions being ungrooved, and a resilient ring interposed between each sleeve and the corresponding guide bore at each end of said sleeve, each resilient ring having a dust cover portion integral therewith and extending along a portion of the sleeve exposed between the guide bore and the adjacent caliper part, the free end of said dust cover engaging with said complementary shaped portion of said sleeve which is outside said diverging enlarged shape portion of said bolt receiving hole for holding the free end of said dust cover portion in engagement with said sleeve adjacent the caliper part and preventing said free end from moving back toward said resilient ring.

4,084,667

VIBRATION DAMPER FOR VEHICLE SPRING SYSTEMS

Klaus Kurrat, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 473,170, May 24, 1974, abandoned.
This application Nov. 23, 1976, Ser. No. 744,453
Claims priority, application Germany, May 26, 1973, 2326983
Int. Cl.[2] F16F *9/34*
U.S. Cl. 188—275 **12 Claims**



1. A vibration damper comprising:

cylinder means,

piston means movably disposed in said cylinder means with a first fluid working space at one side of said piston means and a second fluid working space at the other side of said piston means,

first damping valve means for permitting passage of fluid medium from said first space to said second space in response to a predetermined increase of pressure in said first space upon movement of said piston means in a direction toward said first space,

second damping valve means for permitting passage of fluid medium from said second space to said first space in response to a predetermined increase of pressure in said first space upon movement of said piston means in a direction toward said second space,

bypass connection means for accommodating passage of fluid medium between said first and second spaces in bypassing relationship to said first and second damping valve means,

and bypass valve means for continuously and automatically controlling the flow cross-section of said bypass connection means in dependence on at least one influencing magnitude during both directions of flow of said fluid medium between said first and second space, such that during an increase in said influencing magnitude the flow cross-section of said bypass connection means is reduced and the temporal quantity of said fluid medium directly passing through said first and second damping valve means without throttling is simultaneously increased, each of said first and second damping valve means and said bypass valve means operating independently relative to one another,

wherein one of said cylinder means and piston means includes means for attaching itself to a vehicle superstruc-

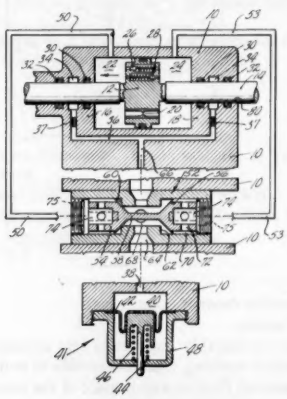
ture and the other of said cylinder means and piston means includes means for attaching itself to a vehicle wheel, and wherein said bypass valve means includes a movable adjusting stepped piston having three stepped piston sections of different diameters, said stepped piston being slidably mounted in an axial bore of said piston means, and wherein a closure member closes one end of said axial bore.

4,084,668

REDUNDANT DAMPER SEALS

Robert Charles Rybicki, Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jun. 5, 1975, Ser. No. 584,238
Int. Cl.² F16F 9/20
U.S. Cl. 188—312 **1 Claim**



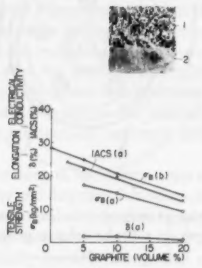
1. A hydraulic damper of the type used in a high centrifugal field for controlling the lead-lag movements of a helicopter blade including a damper casing having a cylinder therein and a piston reciprocable in said cylinder forming with the latter a damper chamber on each side of the piston, a piston rod extended through the end walls of said cylinder, and means for at least doubling the service life of existing dampers of this type including a set of spaced high pressure seals in each of said end walls surrounding said piston rod and capable of resisting the high fluid pressure and fluid impact forces encountered in these dampers, each set including a first seal which acts to resist the high fluid forces of the damper during the first phase of the damper's service life and a second seal which acts to resist these forces during the last phase of the damper's service life, the space between the seals of each set forming a cavity for collecting any fluid which leaks past said first seal, means including a closed fluid reservoir for storing fluid leaked past said first seal, means for maintaining a low pressure fluid in said cavities during the first phase of the damper's service life including cored passages in said casing connecting said reservoir to each cavity, a fluid flow restriction in each of said passages, a shuttle valve having an inlet, and means for operating said shuttle valve by the pumping action of said damper for alternately supplying low pressure fluid from said reservoir to said damper chamber on the retreating side of said piston, said shuttle valve having its inlet connected to said reservoir and also to said cored passages on the side of said restrictions remote from said cavities.

4,084,669

COMPOSITE COLLECTOR

Masateru Suwa, and Katsuhiro Komuro, both of Hatachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 24, 1976, Ser. No. 717,374
Claims priority, application Japan, Aug. 25, 1975, 50-102164
Int. Cl.² B60L 5/08; H01R 39/56, 41/00
U.S. Cl. 191—45 R **21 Claims**



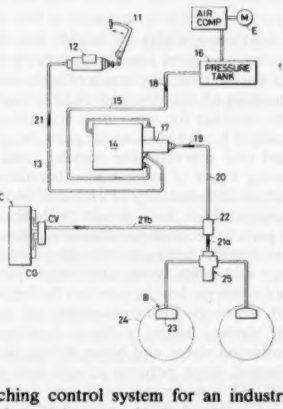
1. A composite collector for collecting and passing an electric current in sliding contact, which is constructed of an integral cast body of metal and comprises on one side providing an electric current-passing sliding surface a layer containing from 5 to 50% by weight of particles of a solid lubricant having a particle size of up to 2.5 mm, dispersed in a matrix of said metal, and a layer composed solely of the metal and free of the solid lubricant on the side of the surface opposite to said sliding surface.

4,084,670

INCHING CONTROL SYSTEM FOR INDUSTRIAL VEHICLES

Seishi Morishita, Osaka, Japan, assignor to Toyo Umpanki Co., Ltd., Osaka, Japan

Filed Dec. 13, 1976, Ser. No. 750,341
Claims priority, application Japan, Dec. 15, 1975, 50-149886
Int. Cl.² B60K 41/24; F16D 67/02
U.S. Cl. 192—13 R **1 Claim**



1. In an inching control system for an industrial vehicle including a brake pedal, a master cylinder for generating a first hydraulic fluid pressure in proportion to the depression force of the brake pedal, air pressure powered booster means for generating a second hydraulic fluid pressure higher than and in proportional response to the first hydraulic fluid pressure, a vehicle braking system, and a vehicle clutch, the improvement comprising:

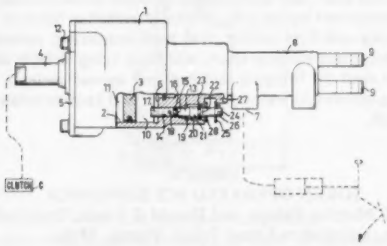
(a) a branch valve,

(b) a line coupling the second hydraulic fluid pressure to the input of the branch valve,
(c) a line coupling a first output of the branch valve to the braking system,
(d) a hydraulic threshold pressure responsive control valve for controlling the engagement and disengagement of the clutch, and
(e) a line coupling a second output of the branch valve to the control valve,
(f) the threshold pressure of the control valve being higher than the pressure at which the braking system is actuated to generate a frictional braking force, whereby a limited brake pedal depression force is effective to actuate the braking system while the clutch remains engaged, and an increased brake pedal depression force, sufficient to generate a second hydraulic fluid pressure higher than the threshold pressure, is effective to disengage the clutch while increasing and maintaining the braking force.

4,084,671
DEVICE FOR WEAR WARNING IN A SERVO OPERATED DISC CLUTCH

Runo Roy Oskar Ternehall, Skarhamn, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Sep. 14, 1976, Ser. No. 723,301
Claims priority, application Sweden, Sep. 18, 1975, 7510448
Int. Cl.[2] F16D *66/02*; G08B *7/04*
U.S. Cl. 192—30 W **5 Claims**



1. A compressed air operated servo mechanism for a disc clutch, especially for motor vehicles, comprising a servo piston (3) movable in a cylinder (2), the piston rod (4) of which is connected to the clutch and is disposed to disengage the same when compressed air is supplied to the cylinder working chamber (10) between the piston (3) and the bottom (6) of the cylinder (2); a valve (13,14), which controls a connection (17,20) between the working chamber (10) of the cylinder (2) and atmosphere and which in the normal operating state of the servo mechanism keeps the connection closed; means (13) connected with the valve for sensing the position of the piston and disposed so that when the piston (3), as a result of a worn clutch disc, assumes a position close to the bottom (6) of the cylinder it transfers the valve to its open position whereby air from the working chamber (10) flows through the connection (17,20) and gives an acoustic signal as well as a pressure signal in the clutch pedal so as to warn the driver.

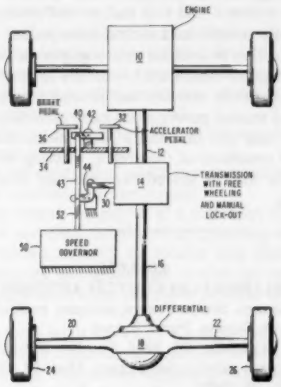
4,084,672
AUTOMATIC CONTROL OF FREE WHEELING

Jack Avins, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,157
Int. Cl.[2] B60K *29/00*
U.S. Cl. 192—.055 **1 Claim**

1. In a motor vehicle having a brake pedal and an accelerator pedal, and having a power transmission means including a free wheeling unit and control means connected to said unit to cause direct drive or free wheeling operation, the combination of:

means responsive to depression of the brake pedal to actuate said control means to provide direct drive operation, and

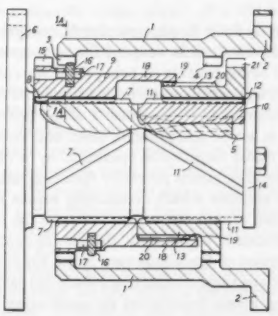


means responsive to depression of the accelerator pedal to actuate said control means to provide free wheeling operation.

4,084,673
ROTARY POWER TRANSMISSION DEVICES

Herbert Arthur Clements, Weybridge, England, assignor to S.S.S. Patents Limited, London, England

Filed Nov. 29, 1976, Ser. No. 745,901
Claims priority, application United Kingdom, Dec. 1, 1975, 49281/75
Int. Cl.[2] F16D *23/10*
U.S. Cl. 192—67 A **4 Claims**



1. A synchronous self-shifting toothed clutch of the type comprising first and second rotary clutch parts, co-acting clutch teeth, intermediate means constrained for movement relative to said second rotary clutch part, and clutch actuating means operative upon passage of said first and second rotary clutch parts through synchronism in one direction of relative rotation to shift said intermediate means relative to said second rotary clutch part in the requisite direction to intitiate interengagement of the co-acting clutch teeth, with the improvements comprising first and second rings of clutch teeth carried by said first rotary clutch part, first intermediate means constrained for movement relative to said second rotary clutch part, a third ring of clutch teeth carried by said first intermediate means, a second intermediate means constrained for movement relative to said second rotary clutch part, a fourth ring of clutch teeth carried by said second intermediate means, said

clutch actuating means operative upon passage of said first and second rotary clutch parts through synchronism in one direction of relative rotation to shift said first intermediate means in the requisite direction to initiate interengagement of said first and third rings of clutch teeth whereby to establish a first power path between said first and second rotary clutch parts and conjointly to shift said second intermediate means in the requisite direction to intitiate interengagement of said second and fourth rings of clutch teeth whereby to establish a second power path between said first and second rotary clutch parts, said first and second power paths each including helical driving surfaces and said first and second intermediate means, in the engaged condition of the clutch, reacting on one another such that the load is shared between said first and second power paths.

4,084,674

DIAPHRAGM CLUTCH ASSEMBLY

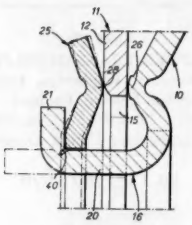
Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Mar. 29, 1976, Ser. No. 671,551

Claims priority, application France, Mar. 27, 1975, 75 09588; Feb. 27, 1976, 76 05485

Int. Cl.[2] F16D *13/44*

U.S. Cl. 192—89 B **16 Claims**



1. An assembly for a diaphragm clutch, comprising a generally annular cover element adapted for connection to a reaction plate and being capable of being fixed for rotation with a pressure plate, a generally annular diaphragm having a peripheral portion forming an elastic washer of the Belleville washer type adapted to act on said pressure plate, and a central portion divided into radial fingers for operation by a clutch release bearing, connecting means pivotally fastening said diaphragm to said cover element which connecting means pass through passages formed in said diaphragm between the radial fingers thereof in the zone in which these fingers are connected to the peripheral portion of the diaphragm and a supporting washer interposed between said connecting means and said diaphragm, the connecting means bearing on the supporting washer on a circumference of a diameter which is smaller than that of the circumference on which said supporting washer bears on said peripheral portion of the diaphragm, and said connecting means comprising at least one flat and relatively thin connecting claw which extends at one end from the cover and which has a generally axial portion passing through one of the passages in the diaphragm and a radially folded wing portion at the opposite end thereof retaining the supporting washer in contact with the peripheral portion of said diaphragm, the axial portion of said at least one connecting claw forming with its wing portion a corner zone in which the supporting washer is pivotally mounted at its inner periphery, the axial edge of this inner periphery being situated at the greater distance from the diaphragm being in contact with said corner zone of the connecting claw, the entire supporting washer being disposed radially beyond the diameter on which the axial portion of said at least one claw is located.

4,084,675

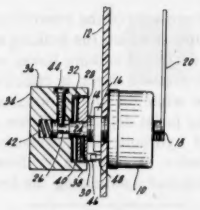
POTENTIOMETER HAVING IMPROVED OPERATING MEANS

Lee H. Smith, and Norman J. Alexandrowicz, both of Waukegan, Ill., assignors to Dynapar Corporation, Gurnee, Ill.

Filed Aug. 24, 1976, Ser. No. 717,285

Int. Cl.[2] F16D *11/00*; G05G *1/12, 5/04*

U.S. Cl. 192—95 **7 Claims**



1. In a potentiometer having a shaft, an improved operating means comprising:

a disc mounted on said shaft for rotation therewith, said disc having a first surface lying generally normal to the shaft and containing engagement means, said shaft containing a circumferential groove located intermediate said first surface and the end of said shaft; and

a knob embracing the end of the shaft having a set screw insertable in said groove for slidably retaining said knob on the shaft while permitting rotation thereof with respect to said shaft, said knob having a second surface containing engagement means lying generally normal to the shaft and facing said first surface, said knob containing means for biasing said surfaces apart, said knob being slidable along the shaft for bringing said first and second surfaces into engagement for causing rotation of said knob to rotate the shaft.

4,084,676

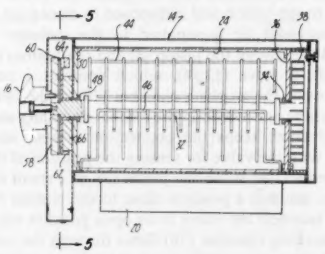
TOKEN OPERATED ICE DISPENSER

Jerry J. Motyka, Detroit, and Donald J. Lewis, Troy, both of Mich., assignors to Lamar Tobias, Sturgis, Mich.

Filed Jun. 21, 1976, Ser. No. 697,778

Int. Cl.[2] G07F *13/00*

U.S. Cl. 194—87 **9 Claims**



1. A dispenser for delivering metered quantities of ice and like materials from a storage chamber comprising: a housing adapted to be mounted on a storage chamber, a magazine member mounted within the housing so as to project into the storage chamber and having a first opening position to permit access therein for material in said chamber and a second opening circumferentially spaced from the first opening to permit material in the magazine member to pass therethrough, closure means rotatably mounted relative to the magazine, bias means drivingly connected to said closure means urging the closure means to a position closing the second opening to prevent the material from passing through the second opening, and selec-

tively operable means for rotating the closure means against the force of the bias means to open the second opening to permit material collected within the magazine to pass therethrough; and clearing means including a clearing member adapted to be rotated with said closure means to force material in said magazine through said second opening upon rotation of said closure means, said clearing member comprising a basket disposed on the shaft for rotation therewith and wherein said clearing means further includes a second clearing member nonrotatably mounted within the magazine adjacent the second opening for clearing ice from the basket.

4,084,677
COIN VALIDATOR MODIFICATION

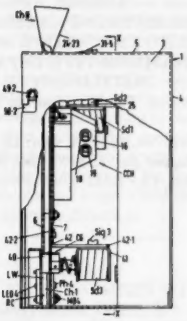
Brian Christopher Searle, Staines, England, and Glenn Richard Ritter, West Allenhurst, N.J., assignors to Cubic Tiltman Langley Limited, Redhill, England

Filed Jun. 9, 1976, Ser. No. 694,459

Claims priority, application United Kingdom, Apr. 8, 1976, 14358/76

Int. Cl.² G07F *3/02*

U.S. Cl. 194—100 A **8 Claims**



1. An electronic coin validator comprising:

a coin chute to guide the coin through the validator;

(a) a coin-denomination detector to sense a coin passing along said chute and provide a signal indicative of the denomination of the coin;

(b) a first stop member located substantially immediately upstream of the detector and normally positioned to block said chute while being movable to permit the stop member to be withdrawn therefrom;

(c) a first solenoid for operation of said stop member to withdraw it from and return it to said chute;

(d) a coin sensor located adjacent said stop member to sense the arrival of a coin thereat and provide a signal indicating the fact; and

(e) an electronic validator circuit comprising means for responding to said sensor signal to provide a signal to operate said solenoid, after a delay sufficient to allow the coin to come to rest on the stop member, to withdraw said stop member from said chute and permit the coin to move past said detector, and then to return the stop member to the chute, and means to respond to said detector signal to determine therefrom whether the coin giving rise to the signal is one of a selected denomination;

said coin denomination detector comprising a transformer the primary winding of which is arranged at one side of said chute and the secondary winding of which is arranged at the opposite side of said chute, so that a coin in passing along the chute passes between the primary and secondary windings of the transformer to produce a signal in the secondary winding dependent on the size and composition of the coin;

said circuit comprising an oscillator to drive the primary winding of the transformer, and a demodulator to demodulate the oscillations in the secondary winding of the transformer to produce, in the no signal condition of the transformer, a steady voltage and, in the signal condition of said transformer, a voltage signal of an amplitude related to the steady voltage dependent on the size and composition of the coin;

said means for responding to said coin sensor signal comprising a timing network to produce a first operating signal and, on termination of said first operating signal, a second operating signal to effect operation of said first solenoid, and a third operating signal; and

said means for responding to said detector signal comprising:

a comparator stage;

a capacitor one terminal of which is connected to a reference potential conductor of the circuit;

an analogue switch connected at a line input thereof to the output of said demodulator, at an operating input thereof to said timing network to receive said third operating signal from the timing network to open the switch and, at a line output thereof, to the other terminal of the capacitor;

an amplifier the input of which is connected to said other terminal of the capacitor and the output of which is connected to said comparator stage to provide a first steady reference voltage thereat to bias the comparator stage at the level of the signal amplitude corresponding to a particular coin denomination even when said capacitor is isolated from said demodulator on opening of said analogue switch;

a voltage follower stage receiving as an input, the output of said demodulator, and connected at its output to said comparator stage so that in the no signal condition of said transformer, the voltage follower stage provides a second steady reference voltage at the comparator stage to maintain together with said first steady reference voltage, a no signal condition at the output of the comparator stage, and so that in the signal condition of said transformer, the voltage follower stage feeds said voltage signal to the comparator stage to cause the latter, when the voltage signal amplitude is at least equal to said bias level, to produce a discrete output signal of a width substantially equal to the width of the peak of the voltage signal that would be produced by a coin of the particular denomination;

a peak generator connected to said demodulator to receive the output thereof and producing a control signal at the peak of said voltage signal; and

an output logic connected at respective inputs to the output of said comparator stage and the output of said signal generator and producing an output signal signifying validation of a coin only when there is a coincidence in time of said control signal and said discrete signal from the comparator stage;

said amplifier comprising a field-effect transistor as the amplifier input stage with the gate of the transistor connected to said other terminal of said capacitor; and a voltage follower as the output stage of the amplifier.

4,084,678
PRINTER NEEDLE GUIDE MEANS FOR MOSAIC PRINTERS

Richard Reier, Taufkirchen, and Peter Kuelzer, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 598,926, Jul. 25, 1975, Pat. No. 4,046,303. This application May 17, 1976, Ser. No. 687,292

Claims priority, application Germany, Jul. 31, 1974, 2436970

Int. Cl.² B41J *3/12*

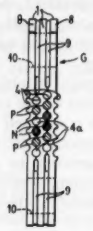
U.S. Cl. 197—1 R **13 Claims**

1. A guide device for the printer needles used in the printer heads of mosaic printers to guide the needles adjacent to the printing area of the associated printer, and comprising:

at least a pair of relatively thin stamped sheet metal guide

member plates having opposite substantially flat end portions and an intermediate area between the end portions defined by opposite plate edges which extend from side to side between said end portions, the guide member plates being assembled together in face-to-face relation with said end portions aligned and secured together;

and each of said intermediate areas of the guide member plates having an array of corrugations which extend between said edges and undulate to opposite sides of the original face planes of the plates;



said corrugations comprising at least on the face-to-face faces of said areas grooves providing guideways for the printer needles;

said grooves being substantially accurately stamped or embossed in the corrugations and free from any cutting shaping so that the groove surfaces are inherently smooth and free from roughness.

4,084,679

TAPE PRINTER

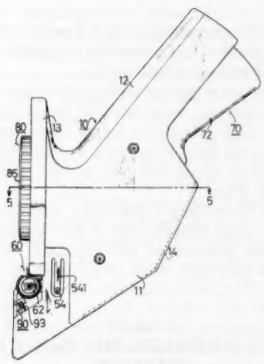
Mituo Fujita, Sakatomachi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan

Filed Aug. 18, 1976, Ser. No. 715,638

Claims priority, application Japan, Aug. 18, 1975, 50-100010; Feb. 5, 1976, 51-11484[U]; May 1, 1976, 51-50353; May 21, 1976, 51-57962

Int. Cl.[2] B41J *1/30*

U.S. Cl. 197—6.7 **16 Claims**



1. A tape printer comprising

a. a tape storing section which stores a roll of tape,

b. a tape extending part which extends a tape leading part pulled out from said tape storing section,

c. a guide means provided on said tape extending part to prevent said tape leading part from moving in a widthwise direction,

d. a type wheel provided with a plurality of types on its periphery in a circumferential direction,

e. a type wheel holding part which holds said type wheel to be rotatable in the circumferential direction so that one of types on said type wheel opposes to the paper tape of said tape leading part on said tape extending part and a type opposing to said paper tape can be selected,

f. a tape impression means which relatively impresses a selected type of said type wheel and the paper tape of said tape leading part opposing to said selected type,

g. an ink applying means which applies an ink for printing to a surface of type of said type wheel opposing at least to said tape leading part in precedence of operation of said tape impression means,

h. a tape feeding means which operates except during operation of said tape impression means and feeds the tape as much as specified at each time of operation, and

i. an operating means which operates said ink applying means, said tape feeding means and said tape impression means at each time of operation.

4,084,680

ENHANCED UNDERSCORING METHODS AND MEANS FOR AUTOMATIC TYPEWRITER AND THE LIKE EMPLOYING HAMMER-TYPE IMPACT PRINTING MECHANISM

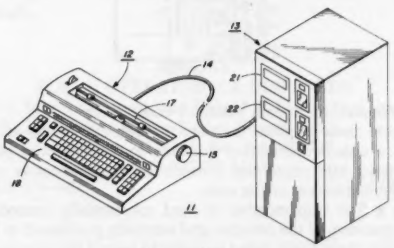
David R. Deetz, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 622,564, Oct. 15, 1975, abandoned.

This application Jul. 5, 1977, Ser. No. 813,060

Int. Cl.[2] B41J *5/42, 29/26*

U.S. Cl. 197—19 **12 Claims**



1. In a printer having a platen for supporting a copy carrier, a printing mechanism for serially printing successive characters on said copy carrier and drive means for moving said printing mechanism transversely of said platen, the improvement comprising a controller including

escapement control means for selectively actuating said drive means on a per character basis to incrementally advance said printing mechanism into position to print said characters, said control means normally causing at least a predetermined per character linear advance of said printing mechanism to ensure that successive characters are printed in spaced apart relationship,

means for entering an underscore command into said controller, and

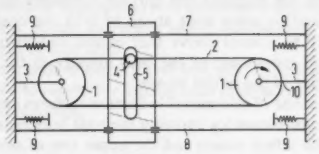
means responsive to said underscore command for signaling said escapement control means to limit the per character advance of said printing mechanism, while successive underscore characters are being printed, to a distance less than a predetermined underscore character width and less than said predetermined per character advance,

whereby said printing mechanism is positioned in response to said underscore command to print successive underscore characters in overlapping relationship.

4,084,681
DRIVE SYSTEM FOR WRITING CARRIAGES IN PRINTING SYSTEMS

Joachim Heinzl, and Günter Rosenstock, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 9, 1977, Ser. No. 775,980
Claims priority, application Germany, Mar. 15, 1976, 2610771
Int. Cl.[2] B41J *19/20;* **F16H** *19/06*
U.S. Cl. 197—82 **14 Claims**

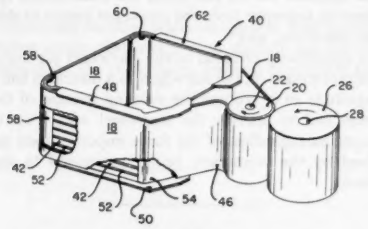


1. A drive system for writing carriages of automatic writing systems comprising a linearly moveable writing carriage, a drive means for said writing carriage, a carriage connection to said drive means, said writing carriage moved back and forth along a line of movement by said drive means acting through said carriage connection, said connection moving around roller means adjacent ends of the line of movement of the writing carriage, the drive means including a driven belt passing around the roller means, the writing carriage undergoing movement in opposite directions along the line of movement with the writing carriage decelerating to zero velocity at the end of the line and then accelerating in the opposite direction and wherein a mechanical energy storing means is provided which receives the kinetic energy of the moving writing carriage during deceleration and returns said kinetic energy upon acceleration in the opposite direction.

4,084,682
INKED RIBBON GUIDE MEMBER WITH TRACKING SURFACES THEREON

Brian M. Fairey, Waterloo, and Paulus E. Plasschaert, Listowel, both of Canada, assignors to NCR Canada Ltd. - NCR Canada Ltee, Mississauga, Canada

Filed Dec. 22, 1976, Ser. No. 753,045
Int. Cl.[2] B41J *33/10*
U.S. Cl. 197—168 **3 Claims**



1. Tracking apparatus for a moving endless ribbon comprising

drive means,

driven means adjacent said drive means and cooperating therewith, said driven means including means for inking said ribbon and providing wetting thereof, and

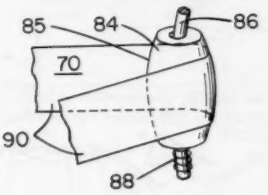
guide means for directing said inked ribbon in a path distal from said drive means and said driven means, said guide means having a smooth surface portion adjacent said drive means and a ribbed guide surface downstream of said smooth surface portion,

said endless ribbon having a slack portion adjacent said drive means and initially engageable with said smooth surface portion of said guide means and tending to adhere thereto by reason of the wet condition of said ribbon and therefrom engageable with said ribbed guide surface of said guide means in limited contact elongated manner in the direction of movement of said ribbon to enable said endless ribbon to track along said guide means.

4,084,683
RIBBON TRACKING SYSTEM

James R. Moss, Lum, Mich., assignor to Computer Peripherals, Inc., Rochester, Mich.

Filed Mar. 17, 1977, Ser. No. 778,767
Int. Cl.[2] B41J *35/04*
U.S. Cl. 197—170 **9 Claims**



1. A tracking system for maintaining a ribbon, movable in a direction along a line of printing, in a desired attitude comprising a

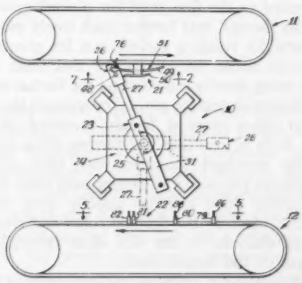
roller engaging said ribbon and having a bore therethrough, a

shaft journaling said roller, said shaft being of a diameter smaller than the diameter of said bore and having a curvature extending therealong, said roller having an axial dimension greater than the width of said ribbon and said ribbon and said roller being axially movable in one direction along said shaft in response to unbalanced forces on said ribbon, and axially movable in the other direction to the desired attitude, and means balancing the gravity effect on said roller.

4,084,684
CONVEYOR TRANSFER METHOD AND APPARATUS

Frank R. Skinner, II, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 24, 1975, Ser. No. 625,522
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—467 **33 Claims**



1. A method of transferring an article carried by a first conveyor to a second conveyor, comprising the steps of:

sensing the presence of an article to be transferred at a pickup position;

pursuing the sensed article with a transfer element; sensing when said article is in a position to be picked up by said transfer element;

picking up the article from the first conveyor with the transfer element; and,

moving the transfer element to bring the picked up article to a dropoff position whereat the article is transferred from the transfer element to the second conveyor.

4,084,685

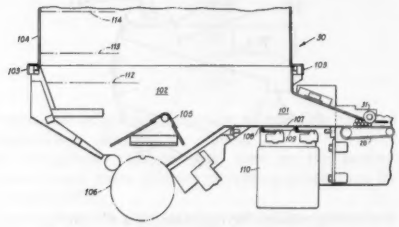
METHOD AND APPARATUS FOR MANIPULATING ROD-LIKE ARTICLES

Frank Hollenton, 3408 Northview Pl., Richmond, Va. 23225, and John L. Ingalls, 9415 Fernleigh Dr., Richmond, Va. 23235

Division of Ser. No. 301,377, Oct. 27, 1972, Pat. No. 3,858,708. This application Jun. 6, 1974, Ser. No. 476,826

Int. Cl.[2] B65G *19/00, 43/08*

U.S. Cl. 198—461 **14 Claims**



1. An apparatus for transporting rod-like articles longitudinally parallel to their axes comprising:

means for moving a continuous stream of rods in a row end to end, a separator means for advancing each rod ahead of those immediately behind it in the stream, said separator means including a set of rollers, the periphery of which rollers engage and advance the rods of the stream, means for turning the set of rollers at a greater peripheral speed than the axial speed of the remaining rods of the stream to thereby advance the leading rod away from the following rods of the stream which have not yet reached the said set of rollers,

at least one roller of the set being a floating roller, the axis of which is movable towards and away from the center line of the stream, and resilient means for resiliently urging said floating roller against the rods in the stream,

and a means for concurrently mounting and driving said floating roller, comprising a first shaft having a fixed axis and a first drive element mounted thereon and coaxial therewith for rotation about said axis, a drive means drivingly engaged with said first driving element to turn the same, a further shaft parallel to the said shaft, a link arm connected to the first shaft for pivotal movement about the axis thereof, said further shaft freely mounted on the link arm for rotation therein and for pivotal movement therewith about the axis of the first shaft, said floating roller being fixedly mounted on the further shaft for rotation therewith and for pivotal movement therewith, and a further drive element fixedly mounted on the further shaft, both of said first and further drive elements being circular members mounted with their circumferential peripheries physically engaging each other for driving of the further drive element directly from the first drive element, whereby the floating roller is driveable from the driving element on the first shaft through the driving element on the further shaft.

9. An apparatus for stacking rod articles side by side comprising:

a container having side walls essentially parallel to each other and spaced apart a distance substantially equal to the length of the rods to be stacked, such that the rods can be stacked with their axes extending across the container perpendicular to the said side walls, said container further including opposed end walls for closing the ends thereof and including an essentially stationary bottom extending generally from one end wall thereof to the opposite end wall thereof,

and an infeed means for feeding the rods into the container at essentially the junction of one end wall and the said bottom of the container with the rods having their axes perpendicular to said side walls and hence parallel to the axes of the rods as they are stacked in the container,said infeed means comprising opposing movable friction surfaces forming a throat and engaging opposite sides of each rod, means for moving both of said friction surfaces for moving the engaged rod into the container with a force sufficient to move rods ahead of it in the container upwardly to a level above that of the said throat, and to prevent movement of the rods already in the container back out of the infeed means,

the lower one of said movable friction surfaces comprising a conveyor means for carrying the rods horizontally to and into the infeed means and the upper one of said movable friction surfaces comprising a rotatable gripper roller spaced slightly above the conveyor to form therewith said throat.

4,084,686

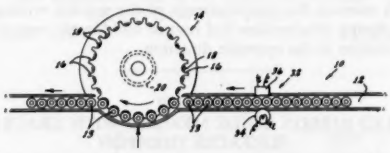
STARWHEEL CONTROL IN A SYSTEM FOR CONVEYING CONTAINERS

Fredrick L. Calhoun, Rolling Hills, Calif., assignor to Industrial Dynamics Company, Ltd., Torrance, Calif.

Filed Nov. 1, 1976, Ser. No. 737,063

Int. Cl.[2] B65G *43/08, 29/00*

U.S. Cl. 198—468 **20 Claims**



1. In combination for conveying containers,

conveyor means for guiding movement of the containers in a particular direction,

a rotatable starwheel for receiving in sequence the containers moving in a particular direction,

means disposed on the starwheel for transferring the containers in sequence from the conveyor means to the rotatable starwheel, and

means operatively coupled to the starwheel for imposing a constant torque on the starwheel in a direction and with a magnitude to overcome the running friction of the starwheel and to provide the starwheel with freewheeling properties regardless of the force imposed upon the starwheel by the containers being transferred to the starwheel.

4,084,687

CONVEYOR HAVING RESILIENT CONVEYING SURFACE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleand, La.

Filed Jul. 2, 1976, Ser. No. 702,035

Int. Cl.[2] B65G *17/06*

U.S. Cl. 198—844 **5 Claims**

1. A conveyor comprising:

a plurality of resilient conveyor sections providing a substantially continuous, flat conveying surface and each including:

a rectangular block of elastomeric material;

first and second elongated, rigid, fastening members of a length substantially coextensive with the length of said

block and each bonded to a respective opposite side of said block;

the upper surface of said fastening members being substantially coplanar with the upper surface of said block to define said conveying surface;

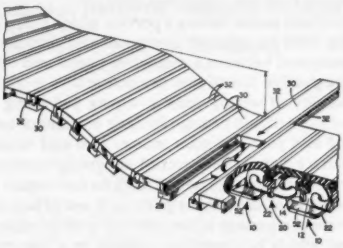
a plurality of first and second modules each having:

a central linking portion terminating in first and second linking ends;

first and second arms integrally formed with said central linking portion and outwardly extending therefrom in respective opposite directions along a transverse axis;

fastening means extending along substantially the entire length of said arms;

the linking ends of each of said first modules being movably coupled to respective linking ends of adjacent ones of said second modules;



said first and second modules thus coupled being angularly movable relative to one another about each coupled linking end in planes parallel and orthogonal to said conveying sections;

the first fastening member of each conveying section being releasably engageable with the fastening means of said first module, and the second fastening member of said conveying section being releasably engageable with the fastening means of an adjacent linked second module, the fastening members of each conveying section being in butting relation with confronting, fastening members of adjacent conveying sections and including fastening means for releasable engagement with the confronting butting fastening members of adjacent conveying sections; and

said conveying sections when coupled to said modules extending across the linking ends thereof and providing a substantially flat continuous, resilient conveying surface.

4,084,688

BOTTLE CARRIER

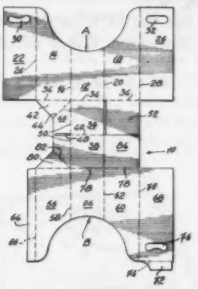
Robert G. Hughes, Rexdale, Canada, assignor to Continental Can Company of Canada Ltd., Toronto, Canada

Filed Nov. 1, 1976, Ser. No. 737,400

Int. Cl.[2] B65D *85/40*

U.S. Cl. 206—188 **7 Claims**

1. A carrier made from a one-piece blank including, when erected, a pair of cells with each cell including an end wall, a pair of opposed side walls and a dividing wall opposed to said end wall and including handle means therein; each dividing wall being adjacent and coextensive with a respective dividing wall of the other cell, the bottom walls formed by a continuous panel extending from the respective end walls of each cell and a rectangular flap connected to the bottom edge of at least one



side wall in each cell to substantially overlay the bottom wall portion of the cell thereby reinforcing said bottom wall.

4,084,689

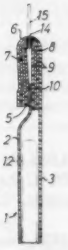
PACKAGING ARTICLE

Ichiki Yamagata, Yao, Japan, assignor to Oji-Yuka Synthetic Paper Sales Co., Ltd., Japan

Filed Nov. 12, 1976, Ser. No. 741,515

Int. Cl.[2] B65D *85/18, 33/02, 33/14, 33/20*

U.S. Cl. 206—280 **4 Claims**

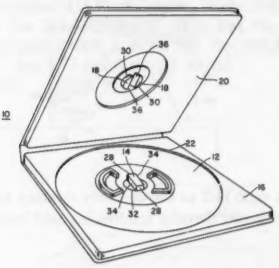


1. A packaging article formed from a thermoplastic sheet film and comprising a front bag panel and a back bag panel thermally fused together along their peripheral edges and defining a bag opening along one edge thereof, one of said front bag panel or said back bag panel being extended to form a flap on one side of said bag opening, said packaging article being characterized in that said flap has a reinforcing body affixed thereto said reinforcing body comprising paper or synthetic paper having a thermoplastic layer applied thereto, said reinforcing body being thermally fused to said flap by the thermal fusion of said thermoplastic resin layer simultaneously with thermal fusion between said front and back bag panels, and adhesive means provided on the edge of said flap said adhesive means extending throughout the width of said bag opening and said adhesive means having a sufficient width to seal the entire edge of said bag opening when it is turned in along with said flap to close said bag opening.

4,084,690
VIDEO DISC PACKAGE HAVING A CENTER POST

Carl Frederick Pulse, Greenwood, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1977, Ser. No. 790,861
Claims priority, application United Kingdom, Aug. 9, 1976, 33098/76
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—310 5 Claims

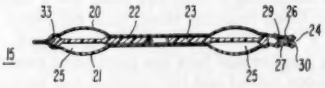


1. A package comprising:
(A) a first member;
(B) a second member;
said first member and said second member defining a cavity for enclosing a centrally apertured disc record when said members are juxtaposed; and
(C) a split center post including:
(a) a first portion attached to said first member; said first portion having arcuate peripheral surfaces dimensioned for engagement with diametrically opposite portions of the wall defining said central aperture of said disc record when said disc record is enclosed in said cavity; and
(b) a second portion attached to said second member; said second portion also having arcuate peripheral surfaces dimensioned for engagement with diametrically opposite portions of said wall defining said central aperture of said disc record when said disc record is enclosed in said cavity;
the construction of said first portion and said second portion being such that said first and second portions interlock and nest within said central aperture of said disc record when said disc record is enclosed within said cavity.

4,084,691
VIDEO DISC PACKAGE

Marvin Allan Leedom, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,730
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—313 13 Claims



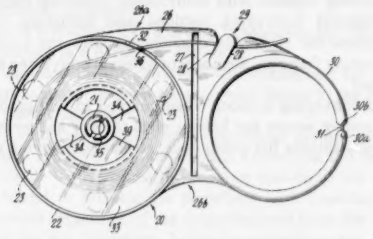
1. A package for a disc record comprising:
a pair of juxtaposed panels defining a cavity for enclosing said disc record;
said panels being joined together along less than their entire peripheral edges; the unjoined peripheral edges of said panels defining an opening in communication with said cavity to permit the insertion and removal of said disc record into and from said cavity; and
a pair of wiping pads; each one of said wiping pads being secured to the respective one of said panels in the region thereof interposed between said record enclosing cavity and said opening in such manner that said wiping pads lie entirely outside said record enclosing cavity, whereby a record enclosed in said cavity does not contact said wiping pads; said wiping pads defining a passage which is constricted relative to said record enclosing cavity.

10. A package for storing a set of two disc records comprising:
a pair of panels;
a partition interposed between said panels;
each of said panels defining in cooperation with said partition a respective cavity for enclosing a disc record;
said package having a pair of openings; each of said openings being defined by an edge of said partition and an edge of a respective one of said panels; and each of said openings being in communication with a respective one of said cavities to permit the insertion and removal of a disc record from the respective cavity;
each of said panels having a portion which forms in cooperation with an adjacent portion of said partition a passage interposed between a respective one of said openings and a respective one of said cavities; and
a plurality of wiping pads; a wiping pad being secured to each one of said passage forming portions of said partition and said panels in such manner that said wiping pads lie entirely outside said record enclosing cavities, whereby records enclosed in said cavities do not contact the respective ones of said wiping pads; each one of said wiping pads forming a passage in conjunction with an adjacent wiping pad which is constricted relative to a respective one of said record enclosing cavities.

4,084,692
DISPENSER FOR SURGICAL THREADS

Joseph Bilweis, Noisy-le-Roi, France, assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 605,791, Aug. 18, 1975 abandoned. This application Feb. 18, 1976, Ser. No. 659,075
Claims priority, application France, Sep. 3, 1974, 74 29955
Int. Cl.[2] A61L *17/02*
U.S. Cl. 206—403 8 Claims



1. A surgical thread dispenser comprising:
a. a flat, cylindrical reel comprising a hub having an axial opening therein and flanges on each side of said hub which in cooperation with each other and said hub form an annular groove adapted to carry a length of surgical thread wound thereon in a plurality of turns;
b. a reel case comprising a circular backing plate at one side of the reel having a centrally located spindle extending outward from said backing plate for supporting the hub of said reel, the outside diameter of said spindle being sized to receive the axial opening in said hub to allow the reel to rotate freely on said spindle, the backing plate having an annular peripheral rim extending radially beyond the outer periphery of said reel and axial beyond the outer flange of said reel, said rim having an opening therein for dispensing the surgical thread from the reel through the rim;

c. a finger ring sized to accept the middle finger of an adult human hand, and oriented in the same plane as said backing plate; and

d. a membrane extending between said finger ring and said backing plate and having a line of weakness extending transversely across the width of the membrane intermediate said finger ring and said backing plate,

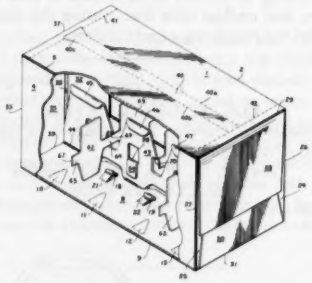
said finger ring being spaced from said backing plate a distance that when the finger ring is placed over a middle finger of a hand and the membrane is bent along said line of weakness to provide an angle between the plane of the finger ring and the plane of the backing plate, the dispenser is positioned in the palm of the hand and the suture is available for withdrawing from the reel through the opening in the rim of the case.

4,084,693

ARTICLE CARRIER

Will Lester Culpepper, Tucker, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 4, 1976, Ser. No. 683,192
Int. Cl.[2] B65D *5/48*
U.S. Cl. 206—427 **9 Claims**



1. A wraparound type carrier for a group of articles disposed in side by side relationship and forming a rectilinear arrangement of at least two rows of articles, said carrier comprising generally parallel top and bottom walls interconnected by spaced side walls to form a tubular structure, one of said parallel walls being of composite construction and including a pair of lap panels foldably joined respectively to corresponding edges of said side walls, a medial keel panel foldably joined to one of said lap panels along the edge thereof remote from the associated one of said side walls, at least one retaining notch formed in said medial keel panel, an insert disposed transverse to said medial keel panel and adapted to form an interlocked relation with said retaining notch, a portion of said medial keel panel being cutaway from the upper edge thereof to a point below said retaining notch to allow entry of said insert into said interlocked relation, and the end edges of said insert being disposed respectively adjacent said side walls.

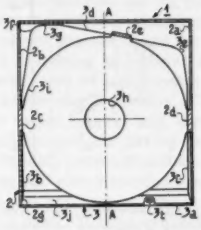
4,084,694

CONTAINER FOR VIDEO DISCS

Lucien Lainez; Bernard Fichot, and Jean-Paul Bijon, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Sep. 7, 1976, Ser. No. 720,657
Claims priority, application France, Sep. 11, 1975, 75 27928
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—444 **8 Claims**

1. A container for retaining, protecting and for allowing the handling without manual contact of a flexible video-disc having a circular central opening for its transfer and its driving in rotation, said container including a substantially rectangular protecting envelope jacket having one of its edges open and three others closed and a substantially flat, quadrilateral, tray-shaped supporting plate slideably displaceable within said envelope for carrying said video-disc; said supporting plate including, at its rear, engaging means for allowing its mechanical handling to and from the envelope, at its front, means for facilitating its insertion and positioning inside said envelope, a central opening greater than that of said disc for allowing the transfer thereof and, on one of its sides, a plurality of arcuate, normally orientated projections, concentric with said central opening for providing a circular hollow seating closely surrounding the circumference of the disc when centered, said envelope including a stop projecting from and integral with at least one of its inner walls, and means for centering the disc on



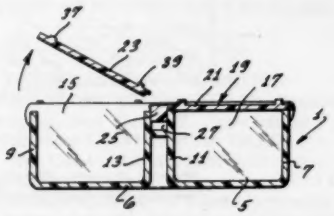
said plate, wherein the improvement comprises that the width of said supporting plate and the distance between at least a portion of the inner walls of the parallel lateral closed edges of the envelope are made to be substantially equal to the diameter of the disc and that the stop projecting inside said envelope is positioned to come into contact with the circumference of the disc and the front of the supporting plate when it is entirely inserted inside the envelope, whereby the inside of lateral edges and the stop of the envelope cooperate to position said disc with its central opening concentrical with that of said support whatever the orientation of the container.

4,084,695

PLASTIC PILLBOX

Frank Halbich, 11923 Salem Dr., Granada Hills, Calif. 91344

Filed Sep. 9, 1976, Ser. No. 721,786
Int. Cl.[2] B65D *83/04*
U.S. Cl. 206—532 **6 Claims**



1. A pillbox comprising:

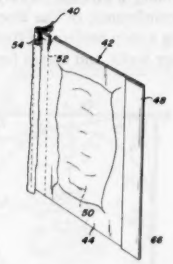
a box having side walls, end walls, and a bottom;

at least one longitudinal member attached between said end walls and with said bottom and comprising a partition;

a plurality of lateral partitions extending between said at least one longitudinal member and said side walls of said box where said plurality of lateral partitions project above said at least one longitudinal member and said side walls, forming compartment in said box;

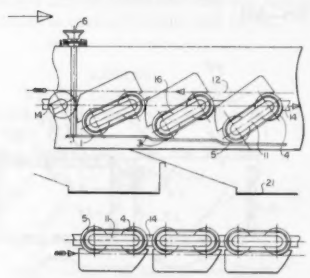
cover means having slots to interfit with said projections of said lateral partitions to comprise a closure for said box, said cover means defining at least one frangible tab covering one of said compartments.

4,084,696
BIND-IN INSERT
Robert E. Katz, 17 Camelot Dr., Livingston, N.J. 07039
Filed Mar. 24, 1976, Ser. No. 669,878
Int. Cl.[2] B65D *27/34*
U.S. Cl. 206—629 **4 Claims**



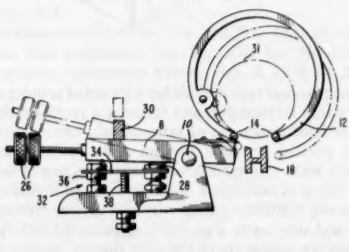
1. A bind-in magazine assembly, comprising:
a. a magazine having a plurality of pages,
b. a unitary bind-in insert formed from a single paper sheet including an envelope and a bind-in strip, the latter being bound between the pages of the magazine,
c. the envelope being closed and containing a sample,
d. the bind-in strip disposed along an edge of the envelope, and being impermeable,
e. a line of separation disposed between the bind-in strip and the envelope along which the envelope can be severed from the bind-in strip to simultaneously move it from the magazine and open it to permit removal of the sample.

4,084,697
SIZER FOR FRUIT AND OTHER AGRICULTURAL PRODUCTS
D. Juan Antonio Sanchez de Leon Rodriquez-Roda, Valencia, Spain, assignor to Food Machinery Espanola, S.A., Valencia, Spain
Filed Jun. 30, 1976, Ser. No. 701,135
Claims priority, application Spain, Jun. 26, 1975, 213.486
Int. Cl.[2] B07B *13/04*
U.S. Cl. 209—106 **1 Claim**



1. A sizer for fruit and other agricultural products, comprising
a plurality of spaced apart calibrating units forming a sizing chain, each of said units comprising a pair of cylinders constituting an upper roller and a lower roller and a support connecting said rollers, said support having a head coinciding with the axis of said upper roller,
a guide,
drive chain means moveably disposed on said guide and connected to said upper rollers for driving said sizing chain, said upper rollers being operatively suspended from said guide and said drive chain means,
a flexible track constituting a supporting surface for said lower rollers, the latter moveably disposed in contacting support on said flexible track,
support means for supporting and controlling the height of said flexible track, said support means including screw-in spindle means for vertically displacing said support means, whereby the different heights of the latter determine different inclination orientations of said calibration units and different sizings of the fruit,
an endless belt operatively disposed about said upper roller and said lower roller of each of said calibrating units, thereby joining said pair of cylinders in joint turning movement, the speed of rotation of said rollers being dependent of the fruit to be sized,
a pulley wheel disposed in a portion of the path of movement of said rollers,
motor means for turning said pulley wheel, the latter frictionally turning said rollers in said path in momentary tangential contact therewith, the speed of rotation of the rollers thereby further being dependent on the motor means,
chain means disposed simultaneously about all of at least one of said rollers of each of said calibrating units for transmitting turning movement to all of said at least one of said rollers, said endless belts transmitting the turning movement to the remaining of said rollers.

4,084,698
EGG WEIGHING DEVICE
Floyd S. Niederer, Titusville, N.J., assignor to Otto Niederer Sons, Inc., Pennington, N.J.
Filed Jul. 13, 1976, Ser. No. 704,854
Int. Cl.[2] A01K *43/08*
U.S. Cl. 209—121 **5 Claims**

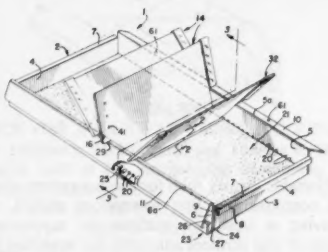


1. In egg grading equipment embodying a plurality of weighing devices, said weighing device each embodying a balance beam having egg supporting means thereon, means for depositing an egg on said egg supporting means, and means for holding said eggs supporting means in a predetermined position for receiving an egg, the combination of activating means for initiating movement of said balance beam and egg supporting means toward an egg discharging position after the deposit of an egg on said egg supporting means, said activating means including a stop means of a fixed, predetermined size engageable with the undersurface of said balance beam to limit downward movement thereof, said activating means further including a spring biasing means secured to said stop means to bias said stop means upwardly against the undersurface of said balance beam.

4,084,699
FILE UNIT
Earl H. Koepke, Youngstown, Ohio, assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Jan. 24, 1977, Ser. No. 762,058
Int. Cl.[2] B65D *57/00;* **B42F** *17/12*
U.S. Cl. 211—11 **12 Claims**

1. A file unit including, a shelf member having a floor and

first and second side walls, and side walls each provided with a plurality of distinct opposed divider mounting means adjacent said floor, a divider including lateral edges and a lower edge extending therebetween, pivot means extending along the entire length of said lower edge and having lateral projections disposed beyond said divider lateral edges and engageable within a selected pair of said opposed mounting means to pivotally attach said divider to said shelf member, each said mounting means having a vertical and lateral extent providing pivotal displacement of said inserted projection, a locally compressible resilient pad overlying said floor and substantially co-extensive therewith, said pad having a top planar surface normally disposed in a vertical plane at least partially obstructing said vertical extent of all said mounting means and thus blocking insertion of said divider projections into said mounting means whereby, said pad top surface is locally compressed by and only beneath said pivot means and its projections when said divider is attached to said shelf member and thereafter constantly engages and biases said pivot means to form a pressure seal therewith extending beneath the entire extent of said divider.



4,084,700

DISPLAY RACK

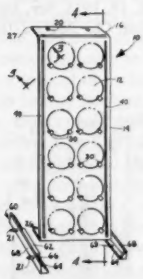
Richard S. Dunchock, Farmington Hills, Mich., assignor to Optarac Corporation, Hollywood, Fla.

Filed Feb. 6, 1976, Ser. No. 655,747

The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.

Int. Cl.[2] A47F *7/02, 7/14*

U.S. Cl. 211—41 **6 Claims**



1. A display rack comprising:

a flat body panel fabricated from a plastic material, said body panel having means associated with the upper edge of said body panel for mounting said body panel to a vertical wall and maintaining said body panel in a substantially vertical plane;

means associated with the lower edge of said body panel for supporting said body panel in an inclined plane when said last mentioned means is positioned on a horizontal surface;

a planer member releasably carried on the front face of said body panel;

a framing member of a generally U-shaped configuration integral with the front face of said body panel, said framing member having a base portion disposed along said panel lower edge with the opposite ends of said base portion terminating at locations inwardly spaced from the side edges of said body panel, said framing member having a pair of upright leg portions, the upper ends of said leg portions terminating at said upper edge of said panel to define an opening thereinbetween, said leg portions being inwardly spaced from and in close proximity to the side edges of said panel, said base and leg portions providing a lateral abutment for said planer member to prevent movement of said planer member across the face of said body panel and not restraining said planer member from outward movement, each of said framing member leg portions further comprising a plurality of integrally formed and vertically spaced support tabs, each tab being of an L-shaped configuration and having one arm projecting towards the other leg portion to define an abutment means for maintaining said planer member against the front face of said body panel, said support tab one arm being spaced from said body panel surface a sufficient distance to provide a snug fit for said planer member when the same is inserted through the opening defined at the upper edge of said body panel and behind said support tabs to securely and releasably attach said planer member to said display rack, said body panel having an aperture formed therein behind each of said tabs, said aperture having a shape which is complementary to its associated projecting arm.

4. A display rack comprising:

a flat body panel fabricated from a plastic material, said body panel having means associated with the upper edge of said body panel for mounting said body panel to a vertical wall and maintaining said body panel in a substantially vertical plane;

means associated with the lower edge of said body panel for supporting said body panel in an inclined plane when said last mentioned means is positioned on a horizontal surface;

a plurality of support means on the face of said body panel for supporting eyeglass lens, each support means comprising two support tabs disposed in an arcuately spaced relationship with respect to each other, each tab having an L-shaped configuration with one leg extending outwardly from said body panel and integral therewith and a second leg extending laterally from said first leg toward the other of said support tabs, the distance between said panel and the inside surface of said second leg being such as to snugly receive and releasably support said eyeglass lens.

4,084,701

TRASH CAN SECURING DEVICE

Thomas L. White, DeSoto, Mo., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 12, 1977, Ser. No. 796,227

Int. Cl.[2] A47G *29/00;* **B65F** *1/00*

U.S. Cl. 211—81 **3 Claims**

1. A trash can securing device for releasably securing a pair of trash cans against marauding animals, and the like, said trash can securing device comprising

a platform secured in a substantially horizontal plane;

hinge means;

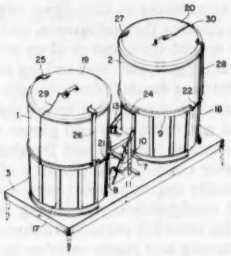
a first pair of substantially semicylindrical frame basket retainers, hingedly affixed by said hinge means to the platform in spaced relation and opening in opposite directions;

a linking device mounted on the platform between the first pair of basket retainers and pivotally coupled to each of said basket retainers at distances above the platform for rotating said basket retainers about their hinge means under the control of a user;

latch means mounted on the platform between the first pair

of basket retainers for releasably securing the basket retainers in positions of inclination relative to the platform;

a second pair of substantially semicylindrical frame basket retainers affixed to the platform in a manner whereby said first basket retainers and said second basket retainers are paired to form a pair of substantially cylindrical trash can retainers, each pair of trash can retainers having a basket



retainer of the first pair and a basket retainer of the second pair; and

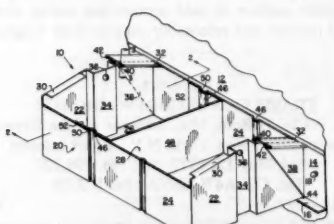
spring means coupling the basket retainer of the first pair to the basket retainer of the second pair in each pair of trash can retainers in a manner whereby when the latch means are released the first pair of basket retainers are forced into substantially horizontal positions corresponding with the cooperating second pair of basket retainers.

4,084,702

PORTABLE STORAGE APPARATUS

Elio Lucchitta, 106A Main St., Hillsburgh, Ontario, Canada

Filed Apr. 11, 1977, Ser. No. 786,469
Int. Cl.[2] A47F *5/08*
U.S. Cl. 211—88 **4 Claims**



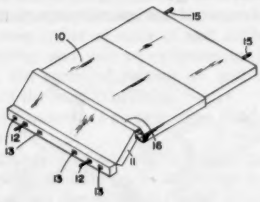
1. A portable storage apparatus comprising an elongated sheet, means to secure said sheet to a vertical supporting surface, a plurality of plates, each of said plurality of plates fixedly secured to and extending substantially normally outwardly from said sheet in spaced apart parallel relationship, each of said plurality of plates having a track fixedly secured to a marginal edge thereof, a container, said container having an open mouth portion, said container having at least a pair of elongated rails fixedly secured thereto adjacent said open mouth portion thereof, wherein said rails are removably slideably engaged within said track of an adjacent pair of plates disposing said open mouth portion in an uppermost position.

4,084,703

REFRIGERATION SHELF

George J. Hossalla, Shoreview, and Norman R. Stein, St. Louis Park, both of Minn., assignors to Stein Industries, Inc., Minneapolis, Minn.

Filed Jan. 6, 1977, Ser. No. 757,455
Int. Cl.[2] A47B *96/02*; A47F *5/00*
U.S. Cl. 211—153 **1 Claim**



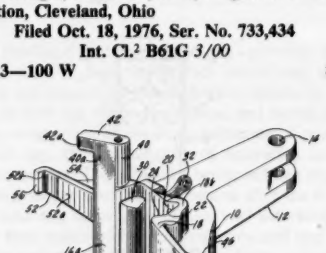
1. An adjustable display shelf for use in a variety of refrigeration units comprising: a first foraminous section, said first section having at least two surfaces for supporting goods thereon; one of said surfaces adaptable for mounting in a horizontal position with the other surface located at an angle to the horizontal to thereby allow for produce to be stacked thereon; a ridge located on said first section, said ridge operable for holding goods in a highly visible position on said horizontal section, said ridge separating said horizontal surface from said surface located at an angle to the horizontal; said first section having members formed to receive a second section; said members located at the edges of said first section and intermediate of the edges of said first section and said second section; a second foraminous section, said second section having a goods supporting surface, said second section further having members formed for sliding engagement with said first section so that said first section and said second section are positionable with respect to one another to thereby allow the adjustable shelf to be used in a variety of refrigeration units; said first section having means located at one end for engaging one side of a refrigeration unit, said second section having means located at one end for engaging the opposite side of a refrigeration unit.

4,084,704

CAR COUPLER

William J. Metzger, Willowick, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Oct. 18, 1976, Ser. No. 733,434
Int. Cl.[2] B61G *3/00*
U.S. Cl. 213—100 W **8 Claims**



1. A car coupler of the rigid jawed-type having a head comprising a buffing jaw and a pulling jaw, said jaws being spaced apart transversely of said head and disposed on opposite sides of the longitudinal centerline of the coupler, said jaws being adapted to interengage with the jaws of an opposing similar coupler, said buffing jaw having a diagonal buffing face on its forward side and a side face extending rearwardly from the forward edge of said buffing face, and coupler gathering

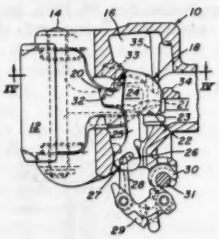
means on said head, said means comprising ledge means spaced above the top of said head and extending diagonally forwardly of the coupler, said ledge means overhanging said side face and having a forward face disposed in the same plane as said buffing face, said forward face being adapted for engagement with said buffing face on an opposing similar coupler to cause laterally displaced couplers to move laterally toward longitudinal alignment as the couplers come together for coupling.

4,084,705

LOCK FOR A RAILWAY VEHICLE COUPLER

Frank W. Oshinsky, McKeesport, and Thomas R. Brown, Sr., Pittsburgh, both of Pa., assignors to McConway & Torley Corporation, Pittsburgh, Pa.

Filed Jul. 18, 1977, Ser. No. 816,621
Int. Cl.[2] B61G *3/00*
U.S. Cl. 213—127 **12 Claims**



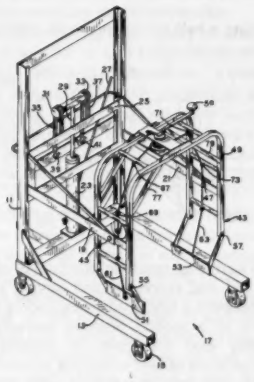
1. In a coupler for a railway vehicle including a head having a lock-receiving chamber, a knuckle and a knuckle thrower supported by said head for movement between open and locked positions, said knuckle thrower being movable with said knuckle toward their locked positions, said head having a guard arm on the side thereof opposite said knuckle, a lock including a leg portion depending from an upper lock body portion which is movable within said lock-receiving chamber between thrown, lock-set and locked positions, a lock ledge on the rear bottom part of said upper lock body portion engaging said knuckle thrower while said knuckle is in a locked position, said lock being movable upwardly in said chamber to said lock-set and thrown positions relative to said knuckle thrower and dropped by gravity toward its locked position when said knuckle is swung to its locked position, a lock-lift assembly including a toggle for moving said lock toward its lock-set position and movable with said lock toward its locked position, a vertically-extending guide rib in said chamber on the knuckle side of said head, said upper lock body portion having on one side thereof at its upper end a laterally-extending lug defining a guide surface adapted to engage said rib to guide the lock and limit rearward tilting thereof during downward movement of the lock toward the locked position, lug means in said head on the guard-arm side thereof extending laterally into said chamber to a point directly rearward of said upper lock body portion when the lock is in said locked position, the rear part of said upper lock body portion being solid with a continuous face surface profile substantially across the width thereof between said lock ledge and the top surface of said lock, the solid rear part of the upper lock body portion being disposed to always overhang said leg portion of the lock during locking of the knuckle to urge and maintain said laterally-extending lug engaged for sliding contact with said rib during dropping of the lock from said unlocked position.

4,084,706

HOISTING DOLLY

Arvin E. Russell, Indianapolis, Ind., assignor to Clifford E. Badgley and C. Brent Badgley, both of Indianapolis, Ind.

Filed Apr. 12, 1976, Ser. No. 676,395
Int. Cl.[2] B65G *65/38*
U.S. Cl. 214—1 D **4 Claims**



1. A carrier for lifting and moving cumbersome objects comprising:

a hand propellable cart including a base consisting of a generally horizontally disposed rectangular frame open at one end to allow the carrier to straddle an object to be lifted and rollably supported on wheels for movement in generally horizontal directions;

a pair of generally horizontally extending arms supported on the base by means providing movement relative thereto in a generally vertical direction;

an open ended object clamp for selectively gripping objects to be transported, the object clamp when gripping the object extending less than completely around the object and including a rigid U-shaped portion, a pair of jaws each pivotably attached to a respective side of the U-shaped portion, and means for moving the jaws toward one another to grip the object said means including cable for each jaw which is attached to the jaw near the free end thereof and hand actuable crank means disposed on the rigid U-shaped portion for tensioning each of the cables to move the free ends of the jaws toward each other, the jaws pivoting about respective free ends of the U-shaped portion whereby an object may be gripped between the jaws and the rigid U-shaped portion;

pivot means connecting the object clamp to the arms near the free ends thereof to allow the object clamp to be rotated freely about a generally horizontal axis whereby the open end of the object clamp may be directed downwardly to engage an object from above and directed horizontally to engage an object from the side.

4,084,707

ROUND BALE LOADING AND UNROLLING MACHINE

Douglas McFarland, Davis City, Iowa 50065

Filed Jul. 26, 1976, Ser. No. 708,987
Int. Cl.[2] B65H *17/00*; B66F *9/18*
U.S. Cl. 214—1 HA **12 Claims**

1. A vehicle-mounted round-bale handling and unrolling machine comprising,

a vehicle having a longitudinal axis parallel to the line of travel of said vehicle,

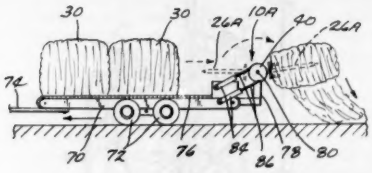
a substantially horizontally extending nonrotatable spindle parallel to said vehicle longitudinal axis and adapted to penetrate a bale of hay along its longitudinal axis as said vehicle is moved towards a bale,

hay-engaging means positioned radially outwardly of said spindle for engagement with said hay radially outwardly of its axial center for rotation about said spindle and its longitudinal axis, and

power means connected to said hay-engaging means for rotating said hay-engaging means and a bale of hay on said spindle for dispensing said hay by unrolling it.

10. A round bale vehicle having an unrolling machine comprising,

a vehicle having a bale conveyor on its support bed, and



a round bale unrolling machine positioned on said vehicle over said bed and conveyor and having a bale spindle pivotable between a first position extending rearwardly of said vehicle to a second position extending forwardly thereof over said conveyor in parallel relationship whereby operation of said conveyor towards said spindle moves a hay bale into engagement with said spindle and operation away from said spindle moves a hay bale off of said spindle.

4,084,708

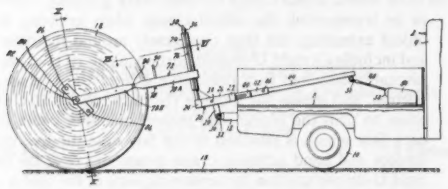
BALE LIFTER AND CARRIER ATTACHMENT

Harold R. Goodvin, Rte. #3, Maryville, Mo. 64468

Filed Oct. 4, 1976, Ser. No. 729,600

Int. Cl.[2] B65G 67/02

U.S. Cl. 214—1 HA **3 Claims**



1. A lifting and carrying device for bales of hay or the like resting on the ground, said device being attachable to any self-propelled vehicle, and comprising:

a. a frame;

b. means operable to mount said frame on said vehicle for pivotal movement on a horizontal axis transverse to the line of travel of said vehicle,

c. a pair of prongs fixed on said frame and projecting therefrom in parallel relation, the vertical planes of said prongs being parallel to said line of vehicle travel and transversely spaced apart relative thereto,

d. operating means carried by said vehicle and operable to pivot said frame relative to said vehicle from a position in which said prongs are horizontal and may be inserted into said bale by propelling said vehicle, to a position in which said prongs are inclined upwardly toward their free ends, whereby said bale is lifted above the ground and is urged onto said prongs by gravity, said operating means being operable to move said prongs to a generally vertical, upwardly projecting position, and,

e. a bale unrolling device operable to unroll cylindrical bales of hay, and comprising a pair of generally horizontal arms disposed in transversely spaced apart relation, means for mounting one end of each of said arms on each of said prongs so as to be horizontally pivotal on said prong and to extend generally at right angles to said prong, a head member carried at the opposite end of each of said arms for rotation on a horizontal axis transverse to said arm and generally coaxial with a cylindrical bale, and including secondary prongs insertable into said bale in generally parallel relation to its axis, and releasable means connecting said arms exteriorly of said bale and operable to prevent separation of said arms by pivotal movement of said arms relative to said prongs, whereby to secure said secondary prongs in engagement with said bale.

4,084,709

DEVICE FOR LIFTING-LOWERING AND ROTATING OPERATIONS

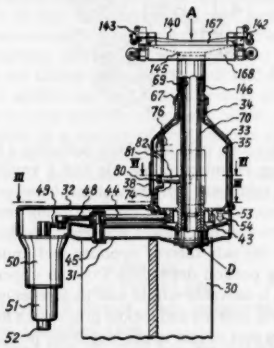
Erwin Bührer, Vogelingasschen 40 8200, Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 598,351, Jul. 23, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 725,115

Claims priority, application Switzerland, Jul. 31, 1974, 10531/74

Int. Cl.[2] B66C 1/62

U.S. Cl. 214—1 BB **17 Claims**

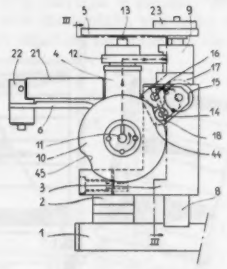


1. A device for moving items to and from different positions in a production operation, such as in a molding operation, comprising an upwardly extending member, a first support mounted on and extending transversely of said member with said first support extending outwardly from at least one side of said member, first means mounted on said first support for releasably engaging items to be moved, second means operatively associated with said member for moving said member upwardly and downwardly and for affording controlled deceleration of said member at the end of the upward and downward movement, and third means operatively associated with said member for rotating said member about a vertical axis and for controlling the acceleration and stopping of the rotational movement of said member, said first means comprising clamps arranged to be moved between released and clamped positions, each of said clamps including a mounting consisting of a part having therein a pair of vertically arranged bolts positioned in horizontally spaced relation, each said bolt being horizontally displaceable within a given limit, each said bolt having an axially extending recess therein, and a rod-like member inwardly tapered toward one end which is engageable within the recess in said bolt for securing said bolt in a predetermined horizontal position.

4,084,710
APPARATUS FOR PRODUCING HORIZONTAL AND VERTICAL RECIPROCATION MOVEMENT OF A TRANSFER ARM

Jacques Yver, Grenoble, France, assignor to Metallurgie Francaise des Poudres-Metafram, Paris, France

Filed Jan. 17, 1977, Ser. No. 759,742
Int. Cl.[2] B65G *47/90*
U.S. Cl. 214—1 BB 6 Claims



1. A device for causing a horizontal to-and-fro motion and a vertical lowering and raising motion after each of the horizontal forward and return motions of a transfer arm connected by one end to the device and comprising at the other end of the transfer arm a device for gripping small or medium parts, the device comprising:

a fixed frame;

a member for driving the transfer arm and to be connected rigidly to the transfer arm;

means mounting said driving member in said frame for horizontal and vertical motion;

two perpendicular shafts;

means mounting said shafts for rotation in the frame;

a flat horizontal cam fixed to one of said shafts;

a flat vertical cam fixed to the other of said shafts;

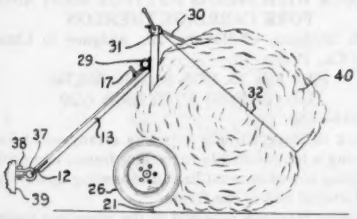
means for driving said shafts in rotation; said cams being coupled to the said driving member such that said horizontal cam constitutes means for causing horizontal motion of said driving member and said vertical cam constitutes means for causing vertical motion of said driving member; and

return means for returning said driving member against the action of said cams in the horizontal plane and the vertical direction respectively.

4,084,711
ROUND HAY BALE LOADING AND UNLOADING CARRIER

T. Wayne Armstrong, Rte. 1, Branch, Ark. 72928

Filed Jul. 5, 1977, Ser. No. 812,924
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—1 HH 10 Claims



1. A round bale loading and transporting carrier comprising

a forward triangular framework having a pair of legs diverging rearwardly from a forwardly disposed junction and a transversely extending shaft rigidly joined to the rearward ends of said pair of legs and defining the third leg of said triangular framework;

a rectangular framework having first and second longitudinal side members and transverse forward and rearward end members;

coaxially opposed bearings secured to said first and second side members respectively near the forward end member, said shaft being rotatively received in said bearings for hingedly connecting said frameworks;

a transversely extending axle rigidly secured near said rearward end member to said longitudinal side members and projecting outwardly therefrom, a wheel rotatively mounted on each of the axle projections and brake means for selectively locking said wheels to said axle;

said rectangular framework sloping downwardly from the forward end member to the rearward end member and having a width of the order of one-half the spacing of said wheels;

a transversely extending stop member rigidly secured to said triangular framework in the downward path of movement of the forward end portion of said rectangular framework;

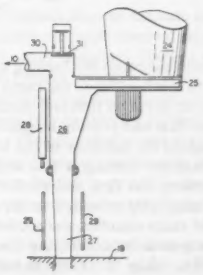
said rectangular framework moving from the sloping position to an upright position concurrently with a rearward movement of the forward end of said triangular framework when said wheels are locked to said axle; and

winch means mounted on the upper end of said first side member, a flexible cable wound in said winch means and extending therefrom to a terminal hook, and means located at the upper end of said second side member for receiving said hook in connected relationship therewith.

4,084,712
CHARGING TRUCK FOR FEEDING COAL INTO HORIZONTAL-CHAMBER COKE-OVENS

Horst Fach, Essen, Germany, assignor to Didier Engineering GmbH, Essen, Germany

Division of Ser. No. 593,045, Jul. 3, 1975, Pat. No. 4,018,655.
This application Jun. 28, 1976, Ser. No. 700,304
Int. Cl.[2] C10B *31/04*
U.S. Cl. 214—35 R 4 Claims



1. A charging truck for feeding coal into horizontal-chamber coke-ovens of the type including a plurality of filling openings arranged side by side in each oven chamber and a riser positioned adjacent one of said filling openings, said charging truck comprising:

a plurality of filling units, one for each of said filling openings, each said filling unit comprising:

a feeder hopper having a lower end;

a charging connection located at a position laterally offset from said feeder hopper, said charging connection having a lower end adapted to extend to a respective filling opening and an upper end, said charging connection being permanently open and free of obstruction from said upper end to said lower end thereof;

selectively operable conveying means positioned for se-

lectively conveying coal from said lower end of said feeder hopper to said upper end of said charging connection such that the thus conveyed coal falls by gravity through said charging connection and into the respective filling opening, the passage of coal from said lower end of said feeder hopper to said upper end of said charging connection being blocked when said conveying means is not operated;

a branch pipe connected to and communicating with the interior of said charging connection at said upper end thereof at a position above said conveying means; and

selectively operable shutoff valve means positioned in said branch pipe for selectively opening and closing communication between said interior of said charging connection and said branch pipe; and

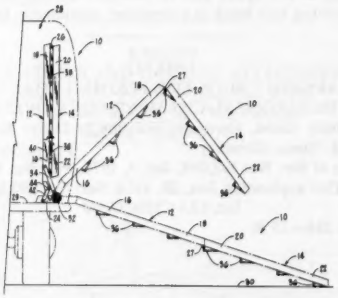
a manifold directly connected to said branch pipes of each of said filling units, said manifold being entirely closed and free of connection or communication with any elements other than said branch pipes.

4,084,713

VEHICLE WHEELCHAIR RAMP

Donald L. Rohrs; Harold A. Downing, and Donald L. Collins, all of Hutchinson, Kans., assignors to Collins Industries, Inc., Hutchinson, Kans.

Filed May 3, 1976, Ser. No. 682,387
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—85 **4 Claims**



1. A vehicle wheelchair ramp for loading and unloading an occupant confined to a wheelchair, the ramp comprising:

a first ramp member having a first end portion and a second end portion, the first end portion hingeably mounted to a ramp base mounted on the floor of the vehicle;

a second ramp member having a first end portion and a second end portion, the first end portion of said second ramp member hingeably mounted to the second end portion of said first ramp member, the second end portion of said second ramp member contacting the ground surface, curb, or the like, when the ramp is unfolded from the vehicle, said first ramp member and said second ramp member folded together and retracted into the vehicle and positioned parallel and adjacent to each other in a vertical position inside the vehicle, said second ramp member including handles mounted on the sides thereof to aid in unfolding the ramp from the vehicle; said first and second ramp members including the following:

"U" shaped guide channels positioned along the length thereof and adjacent the side for guiding the wheels of the wheelchair therein; and

built-in steps positioned along the length thereof and between said guide channels for use by a wheelchair attendant during the loading and unloading of the occupant in the wheelchair, said steps including a series of apertures pierced therein for providing non-slip steps; and

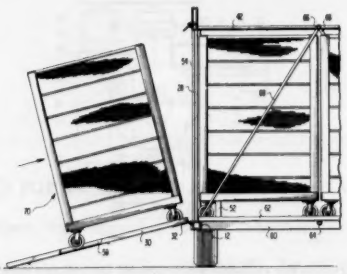
a coil spring attached to said ramp base and a pivot arm, said pivot arm slidably attached to a pivot pin mounted to the side of the first end portion of said first ramp member, said coil spring biasing said pivot arm upwardly for pivoting the ramp into a retracted position in the vehicle.

4,084,714

POULTRY-HANDLING SYSTEM

Melvin L. Williams, 28301 Highway S., Cloverdale, Calif. 95425

Filed Oct. 8, 1976, Ser. No. 730,981
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—515 **4 Claims**



1. A poultry-handling system, which comprises:

wheeled means comprising a plurality of compartments for containing poultry;

means for transporting a plurality of said wheeled means comprising a fifth wheel trailer having a pair of upper and lower longitudinal frame members, and moveable ramp means for loading and unloading said wheeled means disposed along both longitudinal sides of said trailer and extending between said upper and lower longitudinal frame members;

said moveable ramp means comprising a plurality of elongated U-shaped guide members hingedly mounted to said lower longitudinal frame members;

said trailer further including a plurality of channel rails transversely positioned across the bed thereof at spaced locations corresponding to the positions of said guide members for receiving said wheeled means after loading via said guide members; and

means for latching said plurality of guide members in a substantially vertical position comprising an actuating shaft rotatingly coupled to and extending along each of said upper frame members of said trailer, a plurality of retainer bars connected to said shaft at spaced locations therealong which correspond at least to the position of alternate guide members, and a handle at one end of each of said shafts for rotating same and thereby simultaneously rotating said bars into or out of engagement with at least said alternate guide members.

4,084,715

LIFT TRUCK WITH MEANS TO PIVOT MAST AND THE FORK CARRIAGE THEREON

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,743
Int. Cl.[2] B65G *47/00*; B66B *9/20*
U.S. Cl. 214—660 **1 Claim**

1. A fork carriage attitude adjusting arrangement for a lift truck having a longitudinally extending frame, comprising;

a mounting tower secured to and extending upwardly from the forward end of the frame;

lever means pivotally attached to the mounting tower;

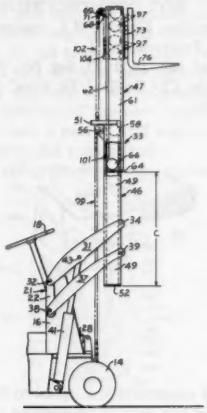
a hydraulic tilt motor operatively connected to the lever means for adjusting the angularity of the lever means relative to the mounting tower;

a pair of vertically spaced parallel arms having forward and

rearwardly disposed ends with the rearward ends pivotally connected to the lever means;

a hydraulic motor mounted to the frame and pivotally connected to one of the arms for pivoting the arms between a lowered and a raised position; and

a mast assembly pivotally connected to the forward ends of the parallel arms in a manner sufficient to maintain the mast assembly at a predetermined attitude relative to the lever means, said mast assembly including at least one upright, a fork carriage, a plurality of rollers rollably associated with the upright, and roller mounting means for rotatably attaching the rollers to the fork carriage to



permit guided vertical movement of the fork carriage relative to the upright and which is selectively adjustable for adjusting the angularity of the fork carriage relative to the uprights; and

wherein said roller mounting means includes a pair of bogie mountings disposed at opposite sides of the fork carriage with each bogie mounting having two of the rollers rotatably mounted thereto and means forming a bore intermediate the rollers, and a pair of eccentric pins selectively adjustably rotatably connected to the fork carriage at opposite sides thereof with each eccentric pin having an annular axially offset portion extending into the bore of the respective bogie mounting.

4,084,716

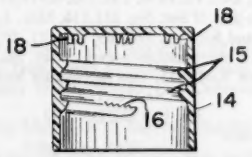
SAFETY CLOSURE FOR CONTAINERS

Clayton Bogert, 118 Lowell Rd., Glen Rock, N.J. 07452

Continuation of Ser. No. 516,231, Nov. 29, 1974, Pat. No. 3,979,001, which is a continuation-in-part of Ser. No. 311,119, Dec. 1, 1972, abandoned. This application Sep. 7, 1976, Ser. No. 720,868

Int. Cl.[2] **B65D** *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—217 **10 Claims**



6. A safety closure for containers comprising a neck portion provided with continuous threads and axially extending serrations formed in the threads,

a cap provided with continuous threads cooperatively engaging the threads on the neck portion and maintaining the cap in radially fixed relation in covering position on the neck portion and axially extending serrations formed in the threads on the cap cooperatively engaging the serrations formed in the threads on said neck portion; and

axially resilient members interposed between the underside of the top of the cap and the top of the neck portion.

4,084,717

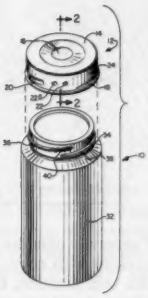
CONTAINER AND CLOSURE

Roderick V. King, Girard, Pa., assignor to VCA Corporation, Baton Rouge, La.

Filed Jun. 29, 1977, Ser. No. 811,325

Int. Cl.[2] **B65D** *55/02, 85/56*

U.S. Cl. 215—217 **14 Claims**



1. A container and closure, wherein said container comprises:

a body portion;

a cylindrical neck portion; and

a plurality of helical container threads equiangularly spaced about the outside circumference of said neck, said container threads having a ratchet portion at their start ends;

and wherein said closure comprises:

a top wall;

an annular sidewall, downwardly depending from said top wall;

a plurality of helical closure threads equiangularly spaced about the inside circumference of said side-wall for cooperating with said container threads to achieve tight fitment of said closure on said container, said closure threads being of the same number as said container threads;

at least one inwardly projecting ratchet tooth separate from each closure thread and adjacent the terminal end of each closure thread for engagement with the ratchet portion of said container thread to prevent removal of said closure from said container while said engagement is maintained; and

flex means for permitting axial movement of said closure to achieve disengagement of said ratchet tooth from said ratchet portion.

4,084,718

COMPRESSION SEAL FOR ELASTOMERIC SEPTUM

Brent Earl Wadsworth, Concord, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 28, 1977, Ser. No. 772,611

Int. Cl.[2] **B65D** *41/20*

U.S. Cl. 215—247 **4 Claims**

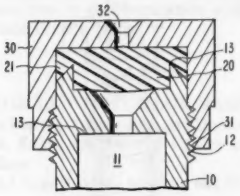
1. In combination, a sealing fixture, an elastomeric septum, and a cap member;

said sealing fixture being of generally cylindrical configuration and having an axial bore therethrough, a first end of said sealing fixture being configured to receive a fluid transfer device within said bore, and a second end of said sealing fixture being configured to receive an open end of a hollow structure within said bore, whereby a quantity of

fluid can be transferred between said fluid transfer device and said hollow structure via said bore,

an outer wall portion of said sealing fixture adjacent said first end of said sealing fixture being tapered inwardly to form a junction with an inner wall portion of said sealing fixture, said inner wall portion adjacent said first end of said sealing fixture being substantially parallel to the axis of said cylindrical sealing fixture, said junction being sharp enough to cut into said septum when said septum is pressed against said junction,

a nontapered outer wall portion of said sealing fixture being threaded, said threaded outer wall portion being intermediate said tapered outer wall portion and said second end of said sealing fixture;



said septum being of generally cylindrical configuration and being disposed coaxially with respect to said sealing fixture in contact with said junction, the perimeter of said septum extending beyond said junction so that a rim portion of said septum lies outside said junction;

said cap member being configured to cover said septum by being threadably received over said threaded outer wall portion of said sealing fixture, whereby said junction cuts into said septum and said rim portion of said septum is compressed between said cap member and said tapered outer wall portion of said sealing fixture when said cap member is screwed down onto said sealing fixture,

said cap member having an aperture through which said fluid transfer device can be inserted into said bore of said sealing fixture by puncturing said septum.

4,084,719

SECURITY CLOSURES

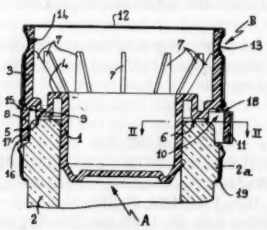
Henri Coursaut-Durand, Mercurey, Givry, France (71640)

Filed Mar. 3, 1977, Ser. No. 774,169

Claims priority, application France, Mar. 16, 1976, 76 08573; Sep. 23, 1976, 76 29177

Int. Cl.² B65D *41/58*

U.S. Cl. 215—256 **8 Claims**



1. A security closure for a container having a neck with an outer surface and having an opening through the neck, comprising a capsule and a stopper within said capsule, said stopper being made of plastic material and shaped to close the opening in the neck, and the stopper including a cylindrical head portion overlying the outer surface of the neck of the container and including a depending integrally formed tearstrip having opposed longitudinal edges extending circumferentially around said outer surface of the container neck, the tearstrip joining the head portion along a line of reduced material thickness, and the tearstrip having one end portion which is free and manually grippable; and said capsule covering said stopper and gripping said container neck, the capsule having an opening of circumferential width greater than its height, said end portion of said tearstrip projecting through the opening outwardly of said capsule, and the capsule having two circumferential lines of weakness which are aligned with said longitudinal edges of said tearstrip.

4,084,720

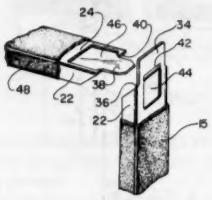
BOX CONSTRUCTION

Benjamin L. Thurston, Lincoln, R.I., assignor to Frost Packaging Company, Pawtucket, R.I.

Filed Jan. 24, 1977, Ser. No. 762,463

Int. Cl.² B65D *7/34*; E04C *2/38*

U.S. Cl. 220—76 **10 Claims**



9. A rim stock construction adapted to form the rim portion of a multi-corner box section comprising an elongated generally thin material strip having a central panel and a pair of generally opposed parallely disposed flanges extending from opposite longitudinal edges of said central panel along the entire extent thereof, said panel terminating in first and second end portions, said first and second end portions respectively having a first tab and a second tab outwardly extending therefrom, said first tab including a transversely disposed slot of an extent at least equal to that of said second tab, and said terminal panel end portions including first and second longitudinally extending depressions, respectively, at least equal in extent to that of said second and first tabs respectively, said depressions adapted to be longitudinally contiguously disposed to one another when said second tab is received within said slot and both of said tabs inwardly bent about their respective terminal ends and substantially entirely received within said depressions respectively underlying said tabs.

4,084,721

CONTAINER WITH ATTACHED CLOSURE

Walter Merton Perry, deceased, late of Darien, Conn. (by Elisabeth D. Perry, executrix), assignor to The Continental Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 712,839, Aug. 9, 1976, and Ser. No. 717,993, Aug. 26, 1976, and a continuation-in-part of Ser. No. 515,444, Oct. 17, 1974, Pat. No. 3,977,578, which is a continuation-in-part of Ser. No. 231,124, Mar. 2, 1972, Pat. No. 3,843,011, and Ser. No. 514,069, Oct. 11, 1974, Pat. No. 3,952,912, and a continuation-in-part of Ser. No. 231,124, Mar. 2, 1972, Pat. No. 3,843,011. This application Nov. 22, 1976, Ser. No. 744,162

Int. Cl.² B65D *41/32*

U.S. Cl. 220—269 **24 Claims**

1. An improved easy open container having a top with easy opening means therein, and said easy opening means comprising,

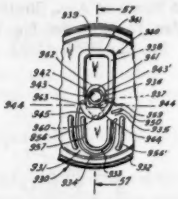
an openable segment of generally rounded corner shape in said container top and with said segment defined by a weakening score line which extends most of the way around the periphery of said segment, but with said score line interrupted at a point to leave an unscored section of

said periphery, and said unscored section providing an integral hingeable attachment means to anchor said segment to said container top after opening of said segment,

said openable segment having an outer end extending toward the peripheral border of said container top, and an inner end extending toward the inner region of said top, and said unscored section of said score line positioned along one side of said segment,

a leverage lift tab for manual opening of said openable segment, and having rivet securement means positioned along its length to permanently secure it to said container top, and with flexible upwardly hingeable connection means between the main body of said lift tab and said rivet, and with said rivet securement means positioned on said top just outward of said openable segment and close to said score line and in the region of said inner end of said segment, and said lift tab having a longer outer lift end extending beyond said segment and closely overlying said top and mainly outward of said segment, and having a shorter inner downward pressure exerting end means extending over only a part of said segment and said part located in its inner end region, and

said inner downward pressure exerting end means of said lift



tab having a plurality of pressure contact means including a first pressure contact means positioned near the portion of said score line which is in the region of said rivet securement means, and a second pressure contact means positioned over said segment at a point spaced away from said portion of score line, and with said second pressure contact means spaced further vertically above the contact surface of said segment than said first pressure contact means, and whereby when said outer lift end of said lift tab is partially raised to start opening said openable segment, said inner pressure exerting end means tilts downward and said first pressure contact means makes initial pressure contact and exerts high downward pressure against said segment near said portion of said score line and initiates rupture along said score line, and whereby further raising of said lift tab end tilts said inner pressure exerting end means down further causing said second pressure contact means to exert high downward pressure against said segment and thereby to extend rupture along said score line, and whereby said segment is bent down into said container where it remains anchored to said top by said hingeable unscored section, and whereby an opening is formed in said container top suitable for outflow of the contents of said container.

4,084,722

CHILD RESISTANT SAFETY CLOSURE

John J. Rosynek, Dolton, and Anilkumar U. Patel, Summit, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

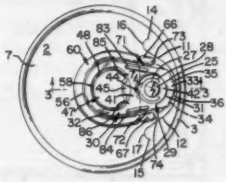
Filed May 9, 1977, Ser. No. 794,882
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **18 Claims**

1. a child resistant safety closure for a can or similar container having an end panel with a score therein defining a tear flap adapted to be torn from the end panel to form a pour opening;

a tab having an attachment portion, a lifting portion and a nose portion for pressing on the tear flap and fracturing the score;

said attachment portion comprising a lug cut therethrough and having one end connected to the tab providing a hinge therefor, accommodating tilting of the tab by said lift portion to force said nose portion panelwardly to fracture said score;

said cut being interrupted to provide a fracturable tie-strap between the lug and the lift portion of the tab, for resisting lifting of the tab, means for attaching the lug to the panel;



shield means on the end panel obstructing grasping of the tab; and

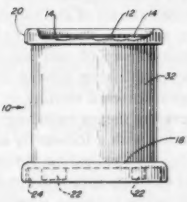
means between the end panel and the tab adapted for prying the lift portion of the tab upwardly from said end panel and attendant fracturing of the tie-strap to disassociate the lift portion from said shield means in accessible position for further lifting and tearing of said tear portion at said score.

4,084,723

CONTAINER WITH BUILT-IN OPENING SYSTEM

Richard P. Parker, 5550 N. 61st Ave., Glendale, Ariz. 85301

Filed May 31, 1977, Ser. No. 801,997
Int. Cl.[2] B65D *41/02*
U.S. Cl. 220—277 **17 Claims**



1. An improved container and container opener comprising in combination,

an enclosed body formed by a body sidewall and being bounded by a top end wall and a bottom end wall formed therewith,

said top end wall of said container having at least one punctum formed therein,

said bottom end wall having puncturing means positionally mounted thereon and extending downwardly therefrom and in vertical alignment with said punctum in said top end wall,

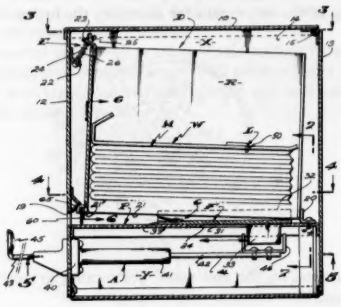
whereby said puncturing means of one container may be positioned against the punctum of another similar container such that upon the application of manual pressure forcing the containers against each other, the said punctum will be punctured by said puncturing means to permit access to the contents of the punctured container.

4,084,724

MAP VENDING MACHINE

Clarence E. Christophersen, San Clemente, and Currie Armstrong, Los Angeles, both of Calif., assignors to Rockwell Enterprises, Inc., Carson, Calif.

Filed Sep. 22, 1976, Ser. No. 721,689
Int. Cl.[2] B65H 7/04
U.S. Cl. 221—20 **12 Claims**



1. A vending machine to retain a stacked supply of flat, horizontal, rectangular multi-paneled folded paper road maps and operable to dispense maps from the stacked supply, one at a time, said machine comprising an elongate vertical box-like housing with top, bottom, front, rear and side walls, a flat, horizontal plate with top and bottom surfaces in the housing in spaced relationship above the bottom wall, a discharge opening in the front wall adjacent the top surface of the plate, an elongate vertical chute corresponding generally in cross-section with the plane configuration of a related folded paper map and slidably receiving a vertical stack of maps, said chute having front and side walls defining lower front and side edges on the chute, means mounting the chute on the plate with its bottom edges in spaced relationship above the top surface, said front edge and top surface defining a map discharge gap in substantial alignment with the discharge opening, an elongate U-shape slide with a flat, horizontal base slidably supported on said top surface and extending transverse the chute and vertical side flanges at the exterior of and slidably engaging the side walls of the chute, said base transportingly supporting a portion of the lowermost map of said stack of maps, gripping means on the base establishing driving engagement with the lowermost map upon forward shifting of the slide relative to the chute, and operating means including a manually operable coin-released actuator with a forwardly and rearwardly shiftable bar carried by and extending through the front panel below the plate, an elongate forwardly and rearwardly extending slot in the plate below the slide, a vertical drive post on the slide depending freely through the slot and below the plate and a drive coupling between the bar and the post.

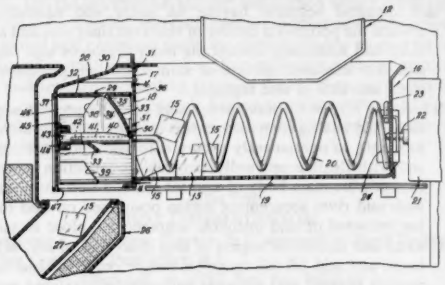
4,084,725

ICE PIECE DISPENSER

William J. Buchser, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 26, 1976, Ser. No. 718,145
Int. Cl.[2] F25C 5/18
U.S. Cl. 221—75 **15 Claims**

1. In an ice piece dispensing apparatus having means for providing a plurality of ice pieces to a transfer position, and a delivery member having a through passage for conducting ice pieces away from said transfer position to a delivery position, the improvement comprising metering means at said transfer position for providing a metered, sequentially independent delivery of said ice pieces one at a time to said passage at a rate substantially less than the maximum delivery capacity of said passage, said metering means being defined by a disc element having a plurality of outwardly extending projections restricting free movement of the ice from the transfer position into said passage.

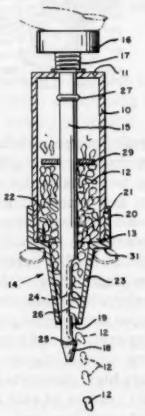


4,084,726

SEED DISPENSER

William A. Nicol, 65 Newtown Ave., Stratford, Conn. 06497

Filed Mar. 18, 1977, Ser. No. 778,866
Int. Cl.[2] B65G 65/62
U.S. Cl. 221—266 **4 Claims**



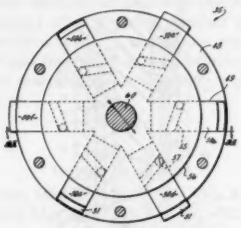
1. A finger-held and operated seed dispenser comprising a tubular transparent container having one end open and the other closed to receive and retain a supply of seeds to be planted; a spout having a collar removably mounted on the open end of the container to give access to the container for reception of seeds, said spout being tapered to permit the passage therethrough, one at a time, of seeds of approximately the same diameter; a seed dispensing rod positioned centrally in said container carried by and extending through the closed end of the container and having on its exposed end a finger operable button; and spring means between the button and the closed end of the container to yieldingly hold the rod in normal inactive position, the other end of said dispensing rod having a diameter approximately equal that of the outlet of the spout to prevent, in idle position of the dispensing rod, seeds from passing through and out of said outlet, said rod having a longitudinal channel positioned in said spout to receive and guide seeds moving by gravity toward the end of the spout, the end of the channel sloping outwardly to permit seeds in the channel to escape one at a time from the spout and drop into a furrow when the dispensing rod is manually moved downwardly through the spout by finger force applied to said button.

4,084,727

APPARATUS FOR DISPENSING RINGS AND FOR APPLYING PISTON RINGS TO PISTONS

Norbert C. Albers, Cincinnati, Ohio, assignor to Designeers Midwest, Division Maswill Industries Incorporated, Cincinnati, Ohio

Division of Ser. No. 636,057, Nov. 28, 1975, Pat. No. 4,047,276.
This application Jul. 5, 1977, Ser. No. 813,085
Int. Cl.[2] B65G *59/06*
U.S. Cl. 221—298 3 Claims



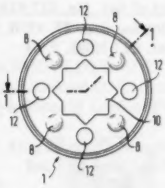
1. Apparatus for applying rings to pistons comprising:
a tube to receive a stack of rings,
a plate in the lower end of said tube,
a plurality of radial pawl slots in the upper surface of said plate,
a plurality of upper and lower pawls slidably mounted in said slots,
a cam disc rotatably mounted in said tube above said pawls,
slot and pin means interconnecting said disc and pawls to cause said pawls to project beyond said tube and retract upon oscillation of said disc, said upper pawls retracting when said lower pawls project and vice versa.

4,084,728

CHILD-PROOF CLOSURE DEVICE FOR CONTAINERS

Otto Stahl, Finnentrop, and Johannes Hins, Sundern, both of Germany, assignors to Georg Menshen & Co. KG., Finnentrop, Germany

Filed Oct. 22, 1976, Ser. No. 734,810
Claims priority, application Germany, Oct. 29, 1975, 7534301[U]
Int. Cl.[2] B67D *5/32*
U.S. Cl. 222—153 14 Claims



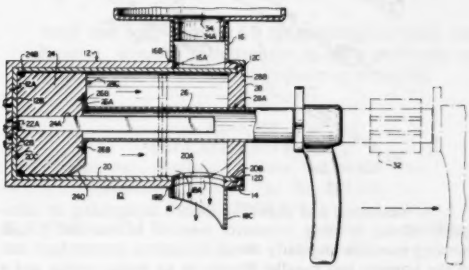
1. A child proof closure device for a container, the closure device comprising
an inner cap member adapted to be secured to the container neck and having at least one dispensing aperture therein,
an outer cap member having at least one dispensing aperture therein,
means permitting relative rotation of said inner and outer cap members between first and second angular positions, said apertures in said first angular position co-operating to permit dispensing of container contents therethrough, and said aperatures in said second angular position being angularly spaced to prevent such dispensing of container contents, and
latching formations on said inner and outer cap members, said latching formations being adapted, when in latching condition, to co-operate to prevent relative rotation of said inner and outer cap members into said first angular positions without the application of external pressure to deform said inner cap member to place said latching formations in unlatching condition.

4,084,729

DISPENSING VALVE

Richard R. Epple, Glen Burnie, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Aug. 28, 1975, Ser. No. 608,637
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—307 11 Claims



1. Valve means for dispensing metered quantities of liquid and semi-solid materials from a reservoir, comprising:
a cylindrical valve housing having diametrically opposed intake and discharge ports formed in the walls thereof adjacent one end thereof and being substantially closed at the other end thereof;
a cylindrical valve sleeve conformally telescoped with said housing and rotatable therein and having a transfer port defined in the wall thereof adjacent one end thereof for selective registry with said intake and discharge ports by rotation of said sleeve;
said sleeve having its other end closed to define a metering chamber and said one end of said housing and said sleeve being closed by a common cover plate having a bearing port defined therein;
guide means internally disposed in said sleeve and affixed thereto;
a piston mounted in said sleeve for reciprocation therein and engaging said guide means to prevent relative rotation of said piston and said sleeve;
a piston rod extending from said piston through said bearing port of said cover plate; and
an actuating handle in the outboard end of said piston rod;
said actuating handle and said piston rod being rotatable and reciprocable to rotate said piston and said sleeve by the interaction of said piston and said guide means between first and second extreme positions, to index said transfer port with said intake port and said discharge port, respectively and to reciprocate said piston between third and fourth extreme positions in said sleeve to ingest and discharge material, respectively, into and from said metering chamber in said sleeve through said intake and discharge ports;
said fourth extreme position juxtaposing said piston with said cover plate; and
said piston being cut back along a portion thereof to provide a cam surface extending from said cover plate to a position overlying said indexed transfer and discharge ports in said fourth extreme position to constrain complete discharge

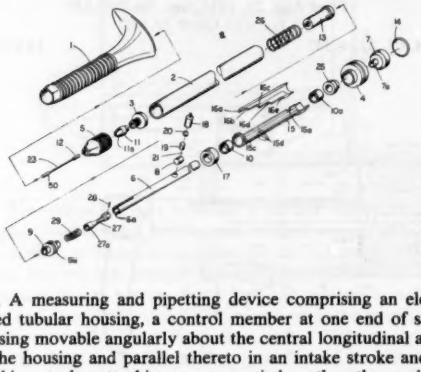
of materials from said metering chamber by movement of said piston.

4,084,730

MEASURING AND PIPETTING DEVICE

Rainer-Burkhard Franke, Heddesheim; Adolf Hirschmann, Heilbronn, and Klaus Kaser, Weinsberg, all of Germany, assignors to Labora Mannheim GmbH fur Labortechnik, Mannheim, Germany

Filed Sep. 15, 1976, Ser. No. 723,515
Claims priority, application Germany, Sep. 18, 1975, 2541642
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—309 **8 Claims**



1. A measuring and pipetting device comprising an elongated tubular housing, a control member at one end of said housing movable angularly about the central longitudinal axis of the housing and parallel thereto in an intake stroke and a working stroke, attaching means carried on the other end of said housing for releasably clamping a filling device into register with the housing bore, a piston member having a stem extending from said other housing end and into the attached filling device, an elongated member carrying a transverse abutment within said housing and attached to said control member, said elongated member being movable parallel to and angularly about the central longitudinal axis of said housing as said control member is correspondingly moved, further attaching means carried by said elongated member for holding said piston stem within the housing, a sleeve fixed within said housing and having a series of longitudinally spaced abutments each spaced angularly from the other about the sleeve wall, said longitudinally spaced abutments each being adapted to selectively engage said transverse abutment on the elongated member depending upon the angular position of said control member, said further attaching means including clamping elements for retaining said piston stem and a guide ring acting thereon to hold the clamping elements in piston stem retaining position, cooperating elements on said attaching means and on said fixed sleeve for removing the clamping force of said guide ring when said control member is pulled outwardly parallel to the housing axis a predetermined distance, and said fixed sleeve having a longitudinal slot extending beyond the abutment most remote from the piston member, said slot accommodating said transverse abutments and defining said predetermined withdrawal distance necessary to remove said clamping force.

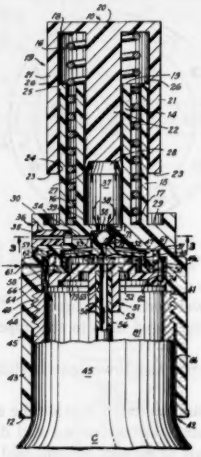
4,084,731

FLUID DISPENSING PUMP ASSEMBLY

John E. Ayres, 540 Fairview Ave., Westwood, N.J. 07675

Filed Jan. 23, 1976, Ser. No. 651,973
Int. Cl.[2] B05B *9/043*; F04B *21/02*
U.S. Cl. 222—380 **1 Claim**

1. A fluid dispensing pump, or the like, comprising, in combination: a housing portion formed with an outlet port, said housing portion further containing a fluid chamber therein which communicates with said outlet port; conduit means communicating with said fluid chamber for conducting fluid from a reservoir to the fluid chamber; diaphragm means formed with an opening therethrough for controlling the flow of fluid through said outlet port, said opening being operatively disposed in a fluid path between said conduit means and said fluid chamber, said diaphragm means including a first valve portion integral therewith, said first valve portion initially obstructing said outlet port and being operably movable only in a substantially snap-like action between obstructing and non-obstructing positions; second valve means cooperative with and movable relative to said opening for controlling the flow of fluid therethrough; and actuating means for compressing the contents of said fluid chamber; said diaphragm means



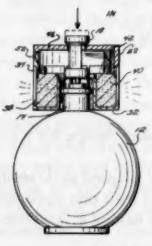
comprising an upper rigid portion integral with said first valve portion, a lower rigid portion, and a relatively flexible portion connecting said upper and lower rigid portions and permitting said upper rigid portion to move in an over-center-type snap-like action with respect to said lower rigid portion and being responsive to the pressure within said fluid chamber and permitting the fluid to be discharged through said outlet port only upon said pressure reaching a minimum predetermined magnitude whereby substantially full atomization of the fluid dispensed is repeatedly realized.

4,084,732

DIRECT AND INDIRECT FRAGRANCE DISPENSING DEVICE

Harry S. Dearling, 25 E. 83rd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 537,923, Jan. 2, 1975, abandoned. This application Sep. 27, 1976, Ser. No. 727,754
Int. Cl.[2] A61L *9/04*
U.S. Cl. 222—402.17 **11 Claims**



1. A fragrance dispensing device for direct or indirect dissemination of a fragrance comprising:

a cover assembly including a cover member adapted to be positioned over the discharge outlet means of a fragrance container,

said cover assembly including a housing adapted to hold a carrier member to receive said fragrance whereby said fragrance may be dissipated over a period of time,

means in said cover member to provide an access passage from within said cover member to the exterior of said cover member,

actuation means including a fragrance spray outlet port therein within said cover assembly and cooperable with said discharge outlet means to discharge a spray of said fragrance from said outlet port, and

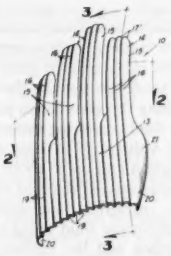
said actuation means and cover assembly being movable relative to each other between a first position wherein said outlet port is oriented in register with said access passage in said cover assembly to discharge said fragrance directly to the exterior of said cover member as a spray and a second position wherein said outlet port is oriented to discharge said fragrance onto said carrier member within said cover assembly to disseminate said fragrance indirectly.

4,084,733

GLOVE FORM

Frank Perlmutter, 1508 Beachcliff Dr., NE., Atlanta, Ga. 30329

Filed Mar. 30, 1977, Ser. No. 782,616
Int. Cl.[2] A41D *1/00*
U.S. Cl. 223—78 **8 Claims**



1. A glove form for drying and shaping gloves comprising a unitary formed thin sheet material form body having a substantial degree of resiliency at least in the transverse direction, said form body simulating the shape of a natural hand and including spaced finger extensions of generally U-shaped cross section and side walls rearwardly of the finger extensions, one side of the form body being open whereby the entire form body possesses a cavity, and the form body having a multiplicity of corrugations formed longitudinally therein and extending from the wrist end of the form body to the forward ends of said finger extensions.

4,084,734

COMBINED SHOULDER AND BELT HOLSTER

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Inc., Temecula, Calif.

Filed Aug. 29, 1975, Ser. No. 608,874
Int. Cl.[2] F41C *33/02*
U.S. Cl. 224—2 B **6 Claims**

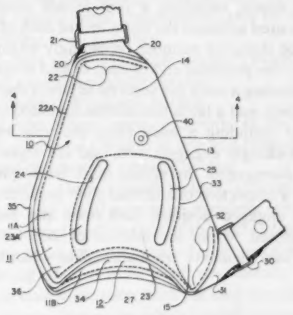
1. A holster for handguns comprising a body of leather or leather like material formed to define a weapon holding pocket between two sides thereof;

said body including edges which define an opening extending substantially the full length of one side thereof and generally paralleling the barrel of a handgun held therein;

said body defining an end opening for said weapon holding pocket for access to the grip of a handgun;

said body extending to substantially enclose the hammer of the weapon in the pocket between edge regions of said body;

spring means biasing said body sides together along the barrel of said weapon and including portions extending into the region of the hammer of a handgun in said holster embracing the hammer of such handgun and biasing inward said body portions for substantially enclosing said hammer, whereby said handgun is more positively retained in said holster and the hammer is protected.

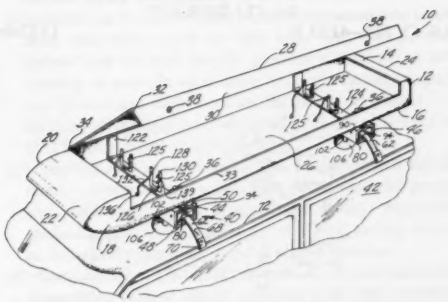


4,084,735

SKI CASE AND RACK

Nick Kappas, 5486 Madison St., Gary, Ind. 46408

Filed Jun. 28, 1972, Ser. No. 267,136
Int. Cl.[2] B60R *9/12*
U.S. Cl. 224—42.1 E **8 Claims**



1. A luggage carrier and rack especially useful for carrying skis comprising a rigid enclosure including top, bottom and side surfaces and having an opening therethrough thereby providing access to the interior of said enclosure, a cover hingedly secured to said enclosure and closing said opening, a plurality of rigid and elongated members, both of said members having a hollow interior and an upwardly facing surface with a slot therein extending between said interior and member surface, said slot also being elongated and extending the entire length of said members, said members also having open ends, a plurality of slide elements having an enlarged head portion and a narrower neck portion fixedly secured to said enclosure bottom in spaced-apart rows, said enlarged portions of each row of said elements being positioned in the interior of a different one of said members, said neck portions being positioned in said slots, a plurality of doors each hingedly secured to respective ends of said members closing said ends, means for locking said doors in a closed position and engaging the head portion of said slide elements hereby preventing the removal of said enclosure from said members without unlocking said doors, means at the opposite ends of said members for securing said members to an upwardly facing surface of a vehicle, said member securing means including a plurality of flexible straps, means for coupling said straps to the respective ends of said

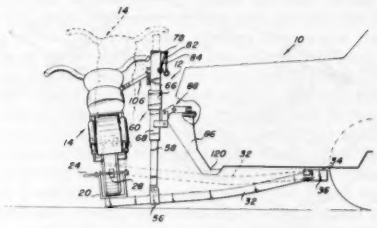
members, said coupling means further including means for adjusting the extension of said straps with respect to said members, a hook element secured to the distal end of each said strap and adapted to engage a portion of said vehicle, said extension adjusting means including a first female threaded member fixedly secured adjacent the distal end of each of said members and a male threaded member threadingly engaged therewith coupled to the proximal end of each of said straps, said locking means including a latch pin secured adjacent the end of each of said members and a latch mechanism mounted on each of said doors and including a latch plate movable between a first position lockingly engaged with said latch pin and a second position disengaged therefrom, said latch plate abuttingly engaging a respective one of said slide members when in said lockingly engaged position, said male and female elements being disposed within the interior of said hollow members whereby said elements are inaccessible when said doors are locked.

4,084,736

VEHICLE MOUNTED MOTORCYCLE RACK

Jacob M. Jacobs, Jr., 721 Parham St., Rocky Mount, N.C. 27801

Filed Jan. 22, 1976, Ser. No. 651,268
Int. Cl.² B60R 9/10
U.S. Cl. 224—42.03 B **12 Claims**



1. A rack for carrying a motocycle on a vehicle having a bumper, comprising:

(a) motorcycle support means having a track on which a motorcycle is supported in an upright position

(b) elongated pivotal support means extending under the vehicle and below the bumper between the vehicle and the motorcycle support means for providing pivotal support for the motorcycle support means

(c) lifting means including a housing enclosing an elongated reciprocably movable lifting member for raising the motorcycle support means and holding it in position

(d) the housing disposed immediately behind and adjacent the bumper

(e) the lower end of the elongated reciprocable lifting member connected to the elongated support means

(f) readily positionable and removable bumper grasping means pivotally connected to the housing of the lifting means and having an element which readily grasps and can be positioned on the vehicle bumper to provide support for the lifting means, and

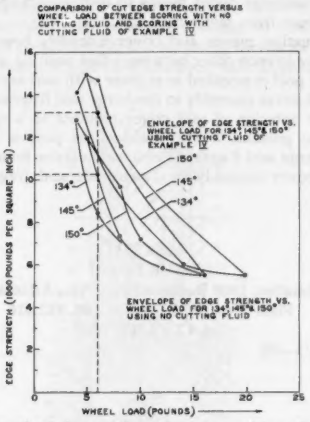
(g) motorcycle retaining means attached to the housing of the lifting means for engaging and holding the motorcycle in fixed rigid position on the motorcycle support means.

4,084,737

OILLESS FLUID FOR SCORING GLASS

Harold R. Gorman, Oakmont; John R. Dahlberg, Jeannette, and James L. Oravitz, Jr., Cheswick, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 16, 1976, Ser. No. 714,880
Int. Cl.² C03B 33/02
U.S. Cl. 225—2 **8 Claims**


COMPARISON OF CUT EDGE STRENGTH VERSUS WHEEL LOAD BETWEEN SCORING WITH NO CUTTING FLUID AND SCORING WITH CUTTING FLUID OF EXAMPLE IV
EDGE STRENGTH (1000 POUNDS PER SQUARE INCH)
WHEEL LOAD (POUNDS)
ENVELOPE OF EDGE STRENGTH VS. WHEEL LOAD FOR 134°, 145° & 150° USING CUTTING FLUID OF EXAMPLE IV
ENVELOPE OF EDGE STRENGTH VS. WHEEL LOAD FOR 134°, 145° & 150° USING NO CUTTING FLUID

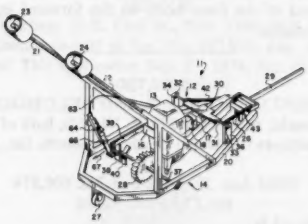
1. In a method for cutting glass comprising the steps of effecting a score on the surface of the glass with a scoring tool and propagating said score through the glass, the improvement which comprises scoring the glass in the presence of an essentially oil-free cutting fluid consisting essentially of from about 2 to 100 percent by volume of at least one highly volatile halogenated hydrocarbon and up to about 98 percent by volume of a highly volatile solvent selected from the group consisting of naphthenic, paraffinic, and aromatic solvents and mixtures thereof, said cutting fluid being present at the interface of the glass surface and the cutting tool to impart increased edge strength to the cut glass edge.

4,084,738

CARRIER FOR AUTOMATIC NAILER

Fredric H. Schneider, 4521 Merrill Ave., Oakland, Calif. 94619

Filed Nov. 29, 1976, Ser. No. 745,570
Int. Cl.² B27F 7/02
U.S. Cl. 227—7 **24 Claims**



1. A carrier for an automatic hand nailer gun of the type in the construction of buildings comprising a carriage having means to hold a hand nailer gun on said carriage with its nail discharge port facing and closely adjacent a construction surface it is desired receive nails at a plurality of locations; a frame having means supporting said carriage for movement along said construction surface between said locations, said frame having a pair of handles projecting therefrom with a hand grip on each to be grasped by a workman moving said frame and carriage along said construction surface; means to trigger discharge at said plurality of locations of a hand nailer gun held

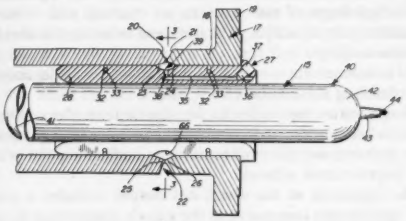
on said carriage; and wheel means on said frame engageable with said construction surface to support the weight of said carrier for movement therealong, said wheel means being substantially in alignment with said nail discharge port and the direction of travel of said carrier over said construction surface whereby said carrier is tiltable about said wheel means in a direction transverse to said direction of travel while said nail discharge port is maintained closely adjacent said construction surface to permit toenailing with said gun.

4,084,739

APPARATUS AND METHOD FOR ALIGNING AND WELDING TUBULAR METAL COMPONENTS TOGETHER

Lawrence D. Koltz, Colgate, and Herbert E. Pritzlaff, Brookfield, both of Wis., assignors to Wisconsin Centrifugal, Inc., Waukesha, Wis.

Filed Feb. 28, 1977, Ser. No. 772,913
Int. Cl.[2] B23K *13/02*; B23P *19/00*
U.S. Cl. 228—168 **22 Claims**



1. An apparatus for concentrically and radially aligning tubular metal components together in coaxial and radial alignment prior to welding them together, in which the said tubular metal components have internal peripheral wall surfaces providing a central internal bore in the said tubular metal components, and the said tubular metal components having outer peripheral wall surfaces and contiguous inner end wall portions each provided with an annular groove and with the said annular grooves coacting to provide an annular groove and weld area between the said contiguous inner end wall portions on the outer peripheral wall surfaces of the said tubular metal components, the said apparatus comprising:

(a) a segmented generally cylindrical tubular mandrel unit comprised of

(1) a plurality of component radial segmental members coacting in assembled relationship to provide

a. a radially expansible generally cylindrical segmented tubular mandrel unit adapted to be inserted into the said internal bore in the said tubular metal components and the said radial segmental members coacting in assembled relationship to provide

1. a central internal tubular passage in the said radially expansible generally cylindrical tubular segmented tubular mandrel unit;

(b) retaining means for retaining the said radial segmental members in assembled relationship;

(c) an inflatable and expandable tubular elastic member including

(1) an inflatable expandable tubular elastic body member adapted to be inserted into the said central internal tubular passage in the generally cylindrical segemented tubular mandrel unit and past the said annular groove and weld area between the said contiguous inner end wall portions of the said tubular metal components and having

(2) a closed inner end wall portion; and

(3) an outer end wall portion provided with

(d) valve means for introducing a gas under pressure into the said tubular elastic body member to inflate it and expand it radially outwardly against the said radial segmental members and thereby expand the said segmented generally cylindrical tubular mandrel unit radially outwardly against the internal peripheral wall surfaces of the said tubular metal components so as to concentrically and radially align the said contiguous inner end wall portions of the said tubular metal components prior to the operation of welding them together;

(e) one of the said radial segmental members having formed therein and extending axially therein

(1) a gas-conducting passage having

a. a gas inlet which opens exteriorly of the said one radial segmental member at one end thereof; and the said gas-conducting passage having

(2) a gas outlet which extends radially through the said one of the said radial segmental members onto the said outer peripheral wall surface of the said radially expansible segmental tubular mandrel unit and the said gas outlet being adapted to be positioned radially inwardly of and in communication with the said annular groove and weld area in the said tubular metal components for discharging an inert gas into the said annular groove and weld area between the said contiguous inner end wall portions of the said tubular metal components prior to and during the operation of preliminarily or tack-welding the said tubular metal components together.

6. A method of coaxially and radially aligning the two tubular metal components and welding contiguous inner end wall portions thereof together in coaxially and radially aligned relationship, which comprises the steps of:

(a) forming an annular groove on the outer peripheral wall surface of an inner end wall portion of each of the said tubular metal components;

(b) assembling the said tubular metal components into assembled relationship with the said inner end wall portions thereof and the said annular grooves in contiguous relationship to provide an annular circumferentually extending groove and weld area on the outer peripheral wall surfaces of the said inner end wall portions of the assembled tubular metal components;

(c) inserting into the interior of the said assembled tubular metal components and axially past the said annular groove and weld area therein a segmented radially expansible generally cylindrical tubular mandrel unit having therein an inflatable expandable tubular elastic member;

(d) directing a first gas under pressure into the said inflatable expandable tubular elastic member with the assembled radially expansible mandrel unit therein to expand the said segmented radially expansible generally cylindrical mandrel unit radially outwardly into engagement with the inner peripheral wall surfaces of the said tubular metal components and thereby radially expand the said tubular metal components radially outwardly into and retain them in coaxial and radial alignment;

(e) directing a second and inert gas through the body of the said segmental radially expansible generally cylindrical mandrel unit into the said annular circumferentially extending groove and weld area independently of and out of communication with the said first gas prior to and during the preliminary welding operating;

(f) partially welding the said inner end wall portions of the said two tubular metal components together as a preliminary welding operation;

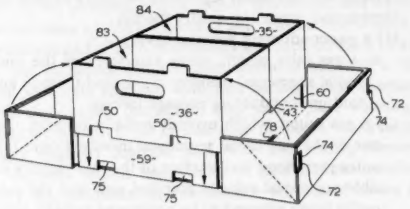
(g) withdrawing the assembled radially expansible segmented mandrel unit and the sid inflatable expandable elastic tubular member from the thus partially welded tubular metal components; and

(h) completing the welding of the two tubular metal components together by filling the said annular groove and weld area with weld metal.

4,084,740
TWO-PIECE SHIPPING CONTAINERS

Achim R. Lorenz, Atlanta, Ga., assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Feb. 2, 1976, Ser. No. 654,066
Claims priority, application Canada, Nov. 14, 1975, 239712
Int. Cl.[2] B65D *13/04, 5/32*
U.S. Cl. 229—23 R 18 Claims



1. A container, comprising:

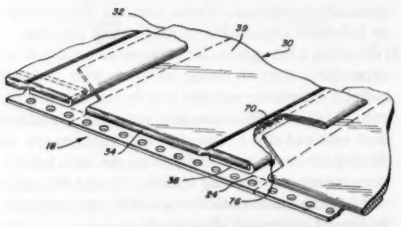
an inner component including a plurality of panels interconnected to define an open-ended sleeve member of rectangular configuration,

and an outer component which includes a rectangular bottom panel, two end panels articulably connected at opposite edges of said bottom panel and receivable within said respective sleeves, and side portions articulably connected at the other two edges of said bottom panel, each side portion being foldable between a closed position in which it covers at least partly the upper open end of said sleeve member and retains the sleeve member against said bottom panel, and an open position in which it uncovers the upper open end of said sleeve member.

4,084,741
CONTINUOUS FORM MULTIPLE PLY ENVELOPE ASSEMBLY

Edward W. Heimann, Woodridge, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Filed Jul. 29, 1977, Ser. No. 820,101
Int. Cl.[2] B65D *27/10*
U.S. Cl. 229—69 16 Claims



1. A continuous envelope assembly consisting of a plurality of individual envelopes each interconnected and wherein each individual envelope comprises:

a top ply having a central area, an integral bottom flap folded across said central area along a transverse fold line so that said bottom flap overlays a portion of said central area, and an integral top flap forming a tongue adapted for sealing said envelope;

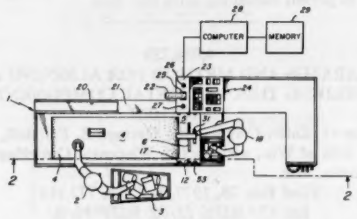
a back ply having adhesive means along the side edges and in a line extending transversely across said back ply for securing said top ply to said back ply along the sides of said back ply and across the edge of said folded bottom flap; and

a pocket formed by the portion of said back ply below said transverse line of adhesive and said folded bottom flap for receiving the top flap of an adjacent envelope.

4,084,742
PRICE MARKING SYSTEM FOR AUTOMATED CHECK-OUT OF MERCHANDIZE

Richard H. Silverman, 347 N. Ave., Weston, Mass. 02193

Filed Aug. 2, 1976, Ser. No. 711,091
Int. Cl.[2] G06K *15/02;* B41F *17/00*
U.S. Cl. 235—419 3 Claims



1. In an automated check-out system of the type wherein individual items of merchandize are marked with a machine readable code identifying the item and wherein the check-out station includes

1. a scanner for reading the machine readable code and deriving signals therefrom, and

2. apparatus responsive to the signals from the scanner for correlating the code read by the scanner with the price of the item and for emitting signals designating the price,

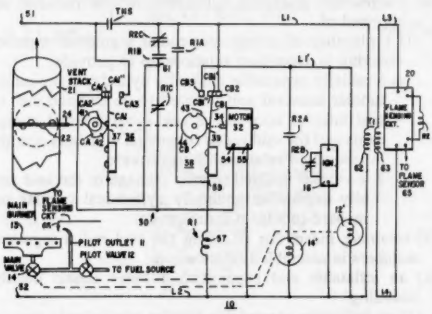
the improvement wherein

the apparatus at the check-out station includes a printing mechanism responsive to the signals designating the price, the printing mechanism being arranged to place the price in human readable form on the individual item.

4,084,743
INTERLOCK ARRANGEMENT FOR A STACK DAMPER CONTROL

Russell Byron Matthews, and Thomas Edward Hayes, both of Goshen, Ind., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Sep. 27, 1976, Ser. No. 726,951
Int. Cl.[2] F23N *0/00;* G05D *23/00*
U.S. Cl. 236—1 G 15 Claims



1. In a heating system including a furnace having a fuel fired burner apparatus, fuel supply means operable when energized to supply fuel to said burner apparatus for combustion to provide heat, a vent stack for conducting combustion products away from said burner apparatus, and stack damper means including a drive motor, and a stack damper plate pivotally mounted within said vent stack, said damper plate being normally maintained at a first position to close said vent stack and being rotatable to a second position to open said vent stack, said drive motor being operatively coupled to said damper

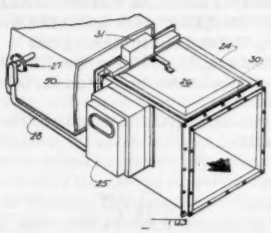
plate for driving said damper plate between said first and second positions, a control arrangement comprising activate means responsive to a request for heat to effect the energization of said drive motor over an energizing path to permit said damper plate to be driven from said first position towards said second position, switching means, limit switch means having first contacts connected in an energizing path for said switching means and second contacts connected in an energizing path for said fuel supply means, said limit switch means being coupled to said stack damper means for operation thereby to close said first contacts providing an energizing path for said switching means and to open said second contacts, interrupting the energizing path for said fuel supply means when said damper plate is at first position, to permit said switching means to be energized by said activate means when said first contacts are closed, said activate means causing said switching means to operate to close third contacts which are connected in said energizing path for said fuel supply means, said stack damper means operating said limit switch means in response to said drive motor driving said damper to said second position to open said first contacts to interrupt said energizing path for said switching means and to close said second contacts to complete said energizing path for said fuel supply means for energizing said fuel supply means, said activate means being operable when the heating demand has been met to deenergize said fuel supply means and said switching means and to effect the reenergization of said drive motor to permit said damper plate to be driven from said second position to said first position.

4,084,744

FIRE DAMPER

Charles Edwin Wilson, Jr., 2473 Cecilia Dr., Villa Hills, Ky. 41016, assignor to Charles Edwin Wilson, Jr., Cincinnati, Ohio

Filed May 5, 1976, Ser. No. 683,494
Int. Cl.[2] F24F *7/00;* **F23L** *17/02*
U.S. Cl. 236—49 **5 Claims**



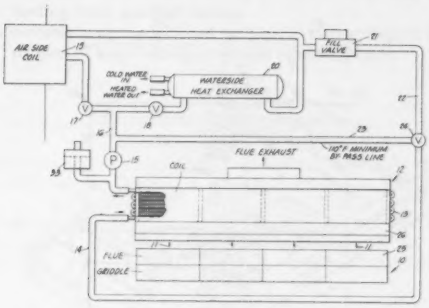
1. A fire damper comprising a housing having a first side open to receive gases from a first area, a second side normally open to permit said gases to flow to a second area, and a third side normally closed; a door pivotally connected to said housing in a first position so as normally to effect the closing of said third side while said first and said second sides are open, said door being swingable by gravity to a second position in which said normally open second side is closed by said door and in which said normally closed third side is open so as to permit said gases to flow from said housing through said third side only; releasable latch means to normally maintain said door in said first position; and heat sensitive means to actuate said releasable latch means in response to temperature changes in said first area whereby to permit said door to swing from said first position to said second position, said heat sensitive means including pneumatic means to actuate said latch means, and a heat sensor in the region of said first area, said heat sensor being electrically connected to said pneumatic means, whereby said releasable latch means are actuated in response to a temperature increase in said first area.

4,084,745

WASTE HEAT UTILIZATION SYSTEM

Robert J. Jones, 2772 Salmon Dr., Los Alamitos, Calif. 90720

Filed Jul. 27, 1976, Ser. No. 709,024
Int. Cl.[2] F24D *3/08*
U.S. Cl. 237—8 R **6 Claims**



1. A system for utilizing heat from the flue gases of gas-fired cooking equipment to heat incoming air to a room and tap water, comprising:

a hood located above and spaced from said cooking equipment;

means carrying a liquid medium therethrough located within said hood such that the flue gases from the cooking equipment pass thereover and transfer heat contained therein to the medium;

a first heat exchanger for transferring heat to a supply of air for a room;

a second heat exchanger for transferring heat to tap water;

a set of conduits interconnecting the liquid medium carrying means and the first and second heat exchangers for circulating the medium in a closed path; and

first temperature responsive valving means interrelated with the conduits for passing the medium through the first heat exchanger and blocking passage through the second heat exchanger when the room temperature is below a predetermined value, and for passing the medium through the second heat exchanger and blocking passage through the first heat exchanger when the temperature is above the predetermined value; and

a further conduit interconnected with said set of conduits and selectively actuatable by a second temperature responsive valving means for proportionately recirculating the medium through the liquid medium carrying means and through the first and second heat exchangers when the medium temperature is within a range at which condensation will occur on the medium carrying means.

4,084,746

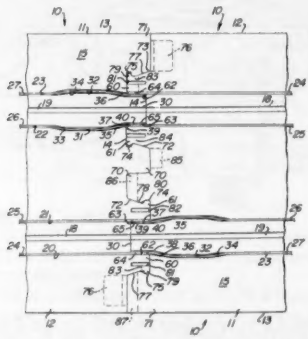
MODEL TRACK SECTION

Richard C. M. Cheng, 1007 Crestmont Ave., Mantua, N.J. 08051

Filed Aug. 25, 1976, Ser. No. 717,581
Int. Cl.[2] A63H *19/30*
U.S. Cl. 238—10 F **5 Claims**

1. A track section for model vehicles comprising an elongate body, vehicle support means extending longitudinally on said body, a formation on each end of said body having one side facing generally laterally and provided with a generally laterally facing concavity, resilient means on said one side of each of said formations extending obliquely therefrom toward said body across the concavity of said formation and being deflectable laterally toward the concavity of the associated formation, interengagement means on each end of said body configured to cooperate with said formation for removable interengagement in end-to-end relation with a like track section with said resilient means deflected laterally toward the adjacent concavity,

said resilient means comprising an obliquely disposed conductive metal strip portion, said interengagement means and formations being configured to guide a like track section longitudinally into and out of said end-to-end relation at an angle with respect to said metal strip portions for laterally deflecting the latter toward said concavities, and an additional conductive metal strip portion extending inwardly from said oblique metal



strip portion longitudinally along said body and having its opposite end portion exposed laterally for bearing engagement with an oblique metal strip portion of a like track section, said obliquely disposed metal strip portion and said additional conductive metal strip portion being an integral length of resiliently deflectable strip material substantially straight in its undeflected condition.

4,084,747

GERM KILLING COMPOSITION AND METHOD

Howard Alliger, 10 Ponderosa Dr., Melville, N.Y. 11746

Filed Mar. 26, 1976, Ser. No. 670,674

Int. Cl.[2] B05B *17/04*

U.S. Cl. 239—4 **13 Claims**

1. Process for the production of a composition having germicidal properties comprising contacting sodium chlorite with a substantially water soluble acid material selected from the group consisting of organic acids and mixtures thereof with inorganic acid, said acid material comprising at least about 15% by weight of lactic acid, and wherein said contacting is carried out in aqueous media and in the presence of sufficient of said acid to lower the PH of said aqueous media to less than about 7.

4,084,748

SPRAY SENSING SYSTEM

Jack William Anderson, Rte. 1, East Berlin, Pa. 17316, and Glenn Hughes, Dillsburg, Pa., assignors to Jack W. Anderson

Filed Jan. 4, 1977, Ser. No. 756,732

Int. Cl.[2] B05B *17/00*

U.S. Cl. 239—74 **11 Claims**

1. A sensing system for indicating the cessation of flow of an electrically conductive fluid of the like issuing from a discharge passage means, comprising:

an electrically conductive probe having a sensing portion positioned near said passage means in the path of the fluid spray issuing therefrom,

probe mounting means for supporting said probe, said probe mounting means and said probe being electrically isolated from said passage means,

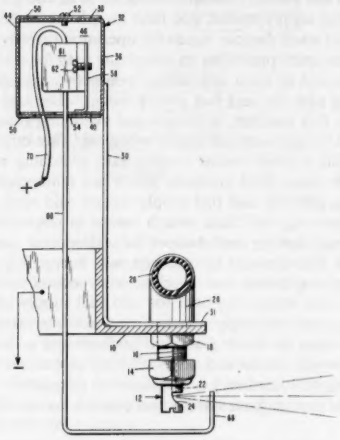
enclosure means enclosing said probe mounting means sufficiently to preclude contact of said probe mounting means by fluid issuing from said passage means, said probe means extending outwardly of said enclosure means,

electrically conductive means in electrical communication with fluid in said passage means,

signal means for indicating the cessation of fluid issuing from said passage means,

electrical power supply means,

electrical switching means connectable to said probe, said electrically conductive means, said signal means and said power means, said switching means being responsive to the making and breaking of electrical communication



between said probe and said electrical conductive means caused respectively by the flow and cessation of flow of fluid from said passage means into contact with said probe sensing portion to operate said signal means between a normal condition when fluid is issuing from said passage means and an alarm condition when fluid has substantially ceased to issue from said passage means.

4,084,749

FLOW REDUCING DEVICES PARTICULARLY USEFUL AS DRIP EMITTERS FOR DRIP IRRIGATION

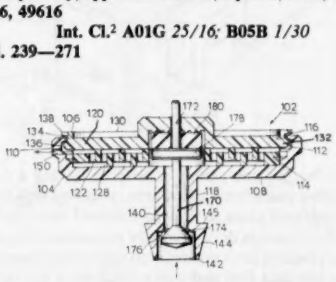
Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Aug. 18, 1976, Ser. No. 715,545

Claims priority, application Israel, Apr. 11, 1976, 49388; May 20, 1976, 49616

Int. Cl.[2] A01G *25/16*; B05B *1/30*

U.S. Cl. 239—271 **7 Claims**



1. A flow-reducing device particularly useful as a drip emitter for drip irrigation, comprising: a housing including a disc-shaped end wall and a peripheral annular wall formed with an annular recess on its inner face to define an inner annular shoulder adjacent to said end wall, and an outer annular shoulder, said housing further including an inlet opening formed centrally through said end wall, and an outlet opening formed through the annular recess of the peripheral wall; a disc-shaped closure cap formed with an annular recess on its outer face to define an inner annular shoulder and an outer annular shoulder; and a disc-shaped flow-retarding member disposed within the housing and having an inlet opening aligned with the central inlet opening of the housing, an outlet opening aligned with the

annular recess in the housing peripheral wall, and a circuitous fluid flow pathway between its inlet and outlet openings for retarding the flow of the fluid therethrough; said closure cap being snap-fitted into the main housing section with the inner annular shoulder of the cap underlying the outer annular shoulder of the main housing section, and with the inner face of the cap applying a compressive force against the flow-retarding member to hold same in position with its outlet opening aligned with said annular recess in the housing peripheral wall, whereby said recess serves as an outlet path for the flow of the fluid to the housing outlet opening.

4,084,750

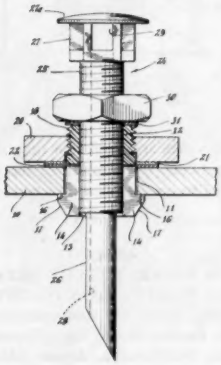
NOZZLE ASSEMBLY FOR FILTERS

Richard H. G. Fett, Poughkeepsie, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Oct. 23, 1974, Ser. No. 517,235

Int. Cl.[2] B01D *35/02*

U.S. Cl. 239—600 **7 Claims**



1. In combination with a plate having a hole for receiving a nozzle assembly, a nozzle holder extending through said hole and having a deformable end portion at one side of the plate, said end portion being adapted for passage through the hole to said one side of the plate, a nozzle extending through said holder and engaging said end portion internally to maintain the same in expanded condition for preventing withdrawal thereof through said hole, said nozzle having a central flow passage with an inlet at said one side of the plate and an outlet at the other side of the plate, the nozzle having a threaded connection with the holder to permit lengthwise adjustment of the nozzle in the holder, whereby the spacing of said passage outlet from the plate can be adjusted, clamping means coacting with the holder at said other side of the plate and including a nut threaded on the holder and tightened against said other side of the plate for clamping said expanded end portion against said one side of the plate, and means sealing said plate hole around the outside of the nozzle holder so that flow through said hole is confined to said nozzle passage.

4,084,751

SELF-PROPELLED MATERIAL STORAGE AND FEEDING VEHICLE

Alex J. Galis, Morgantown, W. Va., assignor to North American Galis Company, Morgantown, W. Va.

Filed Aug. 5, 1976, Ser. No. 712,087

Int. Cl.[2] B02C *13/286*

U.S. Cl. 241—25 **13 Claims**

1. A self-propelled material storage and feeding vehicle comprising,

a base member having ground traction means for propelling said base member,

an elongated frame connected to said base member,

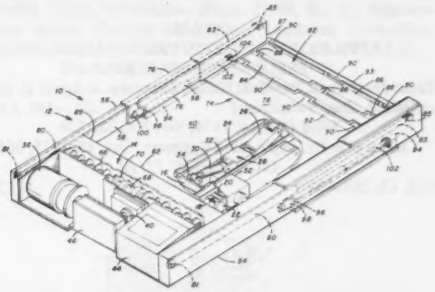
vertical sidewalls secured to opposed sides of said frame and a bottom plate interconnecting said sidewalls to define a fixed storage hopper,

said storage hopper having an open receiving end portion and a discharging end portion,

a material breaker unit supported by said elongated frame forwardly of said storage hopper discharging end portion in overlying relation with said opening,

scroll means positioned laterally of said breaker unit for feeding loose material thereto,

a movable hopper positioned within said storage hopper for reciprocal longitudinal movement relative thereto,



a tailgate secured to the end of said movable hopper and operable to move between an open position for loading loose material into said fixed storage hopper and a closed position for discharging the loose material from said storage hopper, and

fluid actuated means connected at one end to said frame and at the other end to said movable hopper for reciprocating said movable hopper within said storage hopper to feed the loose material from said receiving end portion into said breaker unit.

4,084,752

GAP ADJUSTING SYSTEM FOR CRUSHER AND METHOD

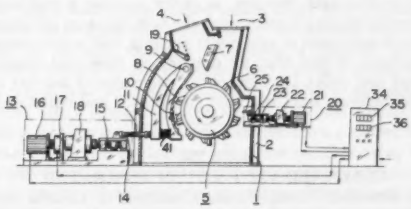
Tatsuo Hagiwara, Funabashi; Fumihiro Nomiyama, Chiba, and Shigenori Nagaoka, Funabashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 15, 1976, Ser. No. 741,952

Claims priority, application Japan, Dec. 11, 1975, 50-147800; May 17, 1976, 51-55264

Int. Cl.[2] B02C *13/26*

U.S. Cl. 241—30 **9 Claims**



2. A system for adjusting a gap between rotary striking blades or hammers and an operating plate in a crusher comprising;

a sensing means capable of coming in contact with said rotating striking blades or hammers during service;

a means for shifting said sensing means towards said striking blades or hammers, said shifting means including a slider on which is disposed said sensing means, a ball screw threaded with said slider, and a first motor for turning said ball screw;

a converting means for converting the extent of shift of said

shifting means into an extent of displacement of said operating plate, said converting means including a computer capable of calculating the difference between the extent of shift of said shifting means and an extent of displacement of said operating plate; and,

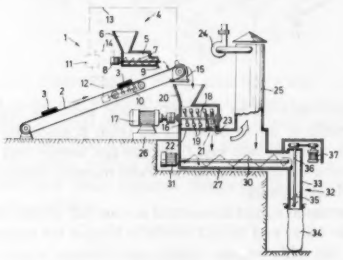
a means for moving said operating plate including a connecting rod connected at one end of said operating plate, a slider supporting the other end of said connecting rod, a ball screw threaded with said slider, and a second motor for turning said last mentioned ball screw, said first and second motors respectively being electrically connected to said computing means.

4,084,753

APPARATUS FOR THE PREPARATION OF INSULATING MATERIAL

Ernst Josef Fruh, Sasbach, Baden, Germany, assignor to Iminex GmbH, Zug, Switzerland

Filed Oct. 14, 1976, Ser. No. 732,200
Claims priority, application Germany, Oct. 15, 1975, 2646130
Int. Cl.² B02C *23/10*
U.S. Cl. 241—34 **8 Claims**



1. Apparatus particularly adapted for forming an admixture of dry materials comprising conveyor means for conveying a first dry material between input and discharge points along a path of travel established by said conveyor means, means for detecting the amount of the first dry material being conveyed by said conveying means, means responsive to said detecting means for feeding a second dry material to said conveying means in proportion to the amount of the first dry material detected by said detecting means, and comminuting means at said discharge point for receiving said first and second material for comminuting the same into homogeneous admixture, said comminuting means including a chamber, a rotatable comminating member in said chamber for comminuting the first and second materials and moving the same between inlet and outlet ends of said chamber, an outlet opening in said outlet end for discharging therethrough the homogeneous admixture, a filter downstream of said outlet opening, and suction means downstream of said filter for drawing air from said chamber through said outlet, to augment the movement of the first and second materials from said inlet end toward said outlet end.

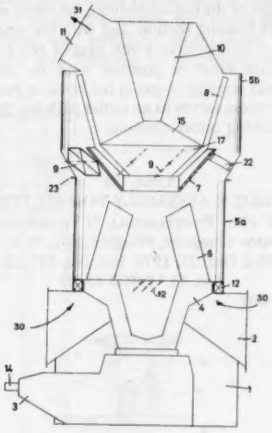
4,084,754

COMBINED VANE-ROTOR SEPARATOR

Horst Brundiek, Neuss, Germany, assignor to Loesche Hartzerkleinerungs-und Zementmaschinen GmbH & Co. KG, Germany

Filed Jul. 27, 1976, Ser. No. 708,935
Int. Cl.² B02C *23/12*
U.S. Cl. 241—52 **3 Claims**

1. In a comminuting apparatus comprising: a roll mill including a grinding pan and a blade ring having blades surrounding the grinding pan; and a combined vane rotor separator mounted on top of the roll mill, the separator including a rotor which has upstanding impellor baffle blades arranged at the periphery thereof, a housing surrounding the rotor to which a feed mixture is supplied in a gas flow from the roll mill and from which the gas and fines leave through a draw-off duct, and a cone located below the rotor and attached to the housing; the improvement wherein the separator further comprises



a series of guide vanes arranged in a ring, the series of guide vanes located between the housing of the separator and the cone and adapted to operate as a flow guide device.

4,084,755

METHOD AND APPARATUS FOR BREAKING UP AND SEPARATING WASTE GLASS TO OBTAIN CULLET

Junzo Shimoiizaka, 1-1-14-803 Komegabukuro, Sendai, Japan; Akira Konosu, Sendai, Japan; Yuzo Hayashi, Sendai, Japan; Kaneji Morita, Nishinomiya, Japan; Akio Sugie, Nishinomiya, Japan, and Kunio Ishioka, Kobe, Japan, assignors to Junzo Shimoiizaka and Yawamura Glass Kabushiki Kaisha, both of Japan

Filed Sep. 20, 1976, Ser. No. 724,532
Claims priority, application Japan, Sep. 22, 1975, 50-115396
Int. Cl.² B02C *19/00*
U.S. Cl. 241—95 **1 Claim**

1. An apparatus for breaking up and separating waste glass to obtain cullet comprising grizzlies inclined and arranged in a multi-stage fashion within a passage for dropping the waste glass so as to provide between them falling heights sufficient to break the waste glass, each of the grizzlies being made up of parallel bars arranged at a spacing smaller than the minimum width of projection of the three-dimensional extraneous matter to be removed, each lower grizzly being so positioned as to receive an oversize portion of the waste glass falling by being

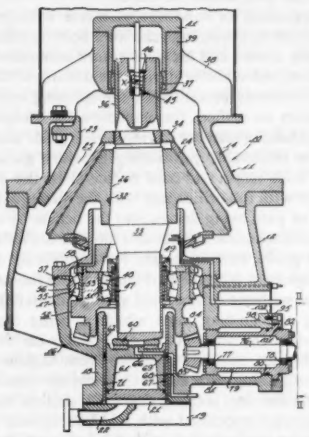
guided by the higher grizzly positioned immediately thereabove without passing through the higher grizzly, an outlet for an oversize portion remaining on the lowermost grizzly being independent of an outlet for an undersize portion passing through each grizzly.

4,084,756

GEAR AND PINION BACKLASH ADJUSTMENT FOR THE DRIVE OF A GYRATORY CRUSHER

Major Coxhill, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jun. 8, 1976, Ser. No. 693,784
Int. Cl.[2] B02C 2/04
U.S. Cl. 241—213 2 Claims



1. In a gyratory crusher having a frame, a crusher head supported for movement on a shaft and a drive connected to rotate the shaft:

a bevel gear connected to effect rotation of the shaft;

a horizontal bore in the crusher frame communicating from the exterior into the interior thereof;

a pinion drive shaft having a horizontal axis supported in said bore for rotation about its own axis and for bodily rotation about the axis of said bore;

a pinion gear mounted on said pinion drive shaft for rotation with said pinion drive shaft and for bodily movement with said pinion drive shaft about the axis of the bore, said pinion gear being meshed with said bevel gear and disposed with its axis transverse to the axis of the bevel gear and in a vertical plane that passes through the axes of both of said gears;

a pair of bearings in which said pinion drive shaft is rotatably supported;

a bearing carrier for supporting said bearings in said bore, the axis of said bearing carrier and said bearings and said pinion drive shaft being concentric;

said bearing carrier being provided with a radially outwardly extending flange that abuts the surface of the frame around said bore;

a clamp ring secured to the frame in position to engage and clamp said radial flange of said bearing carrier to the frame;

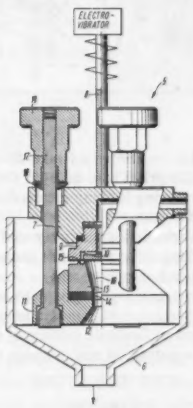
a pair of jackscrews threadedly engaged in said clamp ring and extending therethrough and into engagement with said bearing carrier on opposite sides thereof, said jackscrews when actuated operating to effect rotation of said bearing carrier about the axis of said bore in a selected direction to thereby move said pinion gear vertically with respect to said bevel gear for establishing a predetermined amount of backlash between said gears, said jackscrews acting together being further operable to lock said bearing carrier in an adjusted position.

4,084,757

APPARATUS FOR CONTINUOUS DISINTEGRATION OF CELLS OF MICROORGANISMS

Vladimir Jurievich Rakitin, Verkhny Mikhailovsky pereulok, 7, korpus 2, kv. 113; Igor Konstantinovich Fedorov, Bolotnikovskaya ulitsa, 40, korpus 3, kv. 75; Alfred Nikitovich Grigorian, Snaiperskaya ulitsa, 7, kv. 91, all of Moscow; Vitaly Viktorovich Lalov, Sovetskaya ulitsa, 22/49, kv. 12, Moskovskaya oblast, Podolsk, and Nina Vasilievna Prokofieva, Botanicheskaya ulitsa, 19, kv. 68, Moscow, all of U.S.S.R.

Filed Aug. 5, 1976, Ser. No. 711,951
Int. Cl.[2] B02C 19/00
U.S. Cl. 241—301 8 Claims



1. In an apparatus for disintegrating microorganism cells in a gas-saturated suspension, a disintegrating unit comprising a valve means having a pair of valve components one of which is a valve seat and the other of which is a valve member having at least one elongated projection terminating in an edge which engages said valve seat when the unit is not operating, spring-loading means operatively connected with at least one of said components for urging the latter toward each other to maintain said edge of said projection in engagement with said valve seat when the unit is not operating, adjusting means operatively connected with said valve means for adjusting the force with which said spring-loading means urges said components toward each other, said components cooperating with each other for defining between themselves a chamber part of which is defined by said projection and a surface of said valve seat which is adjacent said projection, said valve means being formed with a passage communicating with said chamber for feeding said gas-saturated suspension thereto a predetermined pressure sufficient to displace said valve member away from said valve seat in opposition to said spring-loading means to an extent which will define during operation of the disintegration unit between said projection and valve seat a narrow slit through which the suspension flows from said chamber to be suddenly reduced to atmospheric pressure.

4,084,758

MACHINE HAVING AN IMPROVED TAKE-UP REEL FOR WINDING HOLLOW FILAMENTS

Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

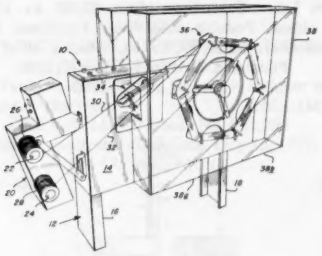
Filed Feb. 13, 1976, Ser. No. 658,142
Int. Cl.[2] B65H 54/56, 49/30
U.S. Cl. 242—18 G 5 Claims

1. A machine for preparing a continuous, hollow, and semi-

permeable filament for use in a hollow fiber dialyzer, which dialyzer includes a plurality of substantially-equal-length open-ended fibers formed from said filament, said machine including:

(a) a body;
at least one supply spool of said filament, said spool being rotatably mounted on said body;

(b) a take-up reel having at least two radially spaced support means about which said filament is wound, said reel being rotatably mounted on said body; and



(c) drive means for rotating said take-up reel; wherein the improvement comprises said take-up reel, including:

(d) a hub member having locking means drivingly associated with said drive means;

(e) winding plate means for carrying said filament support means being adapted for releasable securement in driving relation to said hub member; and

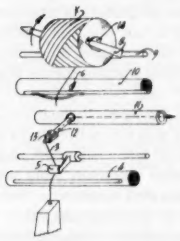
(f) said support means cooperating with said winding plate means for supporting said bundles in a substantially exposed disposition to facilitate cutting of said bundles upon completion of winding on said take-up reel.

4,084,759

METHOD AND A DEVICE FOR WINDING UP A YARN RESERVE

Mario Piro, Genoa, Italy, assignor to Nuova San Giorgio S.p.A., Genoa-Sestri, Italy

Filed May 17, 1976, Ser. No. 687,232
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 PW **12 Claims**



1. A method of winding up a yarn reserve from an open-end spinning unit on a winding tube for a bobbin, wherein the winding tube includes a yarn adherence zone at one end of the tube and wherein the tube is rotatably driven, and wherein during the step of bobbin doffing yarn which is continuously produced by the spinning unit is drawn by suction into an orifice, the method comprising the steps of: continuously applying a suction force to the yarn exiting from the spinning unit to draw the yarn into the orifice, providing a yarn guide positioning element with a yarn guide carried thereby, disposing the yarn guide positioning element with the yarn guide in alignment with the orifice and with the yarn guide in the path of the yarn being drawn into the orifice by the suction force so that the yarn being drawn by the suction force applied thereto is drawn into engagement with the yarn guide before it is drawn into the orifice, removing the yarn guide positioning element from alignment with respect to the orifice while the yarn is being continuously drawn from the spinning unit into the orifice and while the yarn is being drawn into engagement with the yarn guide, positioning the yarn guide positioning element so that the yarn guide orients the yarn engaged thereby above the yarn adherence zone of the tube and in a predetermined orientation with respect to a yarn guide device associated with the tube, breaking the yarn which is engaged by the yarn guide and allowing a portion of the yarn to engage the yarn adherence zone of the tube while an end portion of the yarn disposed axially outward of an end of the tube engages the yarn guide device, and forming yarn reserve turns before winding the yarn about the bobbin.

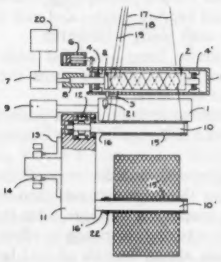
4. In apparatus for winding a yarn reserve from an open-end spinning unit on a winding tube for a bobbin, wherein the tube is rotatably driven and includes a yarn adherence zone at one end thereof and wherein during the doffing of the bobbin the yarn continuously produced by the spinning unit is drawn by suction into an orifice, the improvement comprising a yarn guide positioning element having a yarn guide carried thereby, means for removably positioning the yarn guide positioning element with respect to said orifice with the yarn guide in alignment with the orifice and with the yarn guide disposed in the path of yarn being drawn into the orifice by the suction so that yarn being drawn by suction into the orifice is engaged by the yarn guide, suction means for continually drawing yarn into engagement with the yarn guide while the yarn guide is in alignment with the orifice, said yarn guide defining means for engaging and guiding yarn which is being drawn into the orifice when the yarn guide is aligned with the orifice and when the yarn guide is removed from alignment with said orifice for guiding yarn above the yarn adherence zone of the tube while the yarn is being drawn by suction into the orifice, a guide device associated with said bobbin, said guide device disposed for engagement with a portion of the yarn being guided by said yarn guide when said yarn guide is disposed above the yarn adherence zone of the tube, means for breaking the yarn engaging the yarn guide while the yarn is disposed above the yarn adherence zone of the tube to allow a portion of the yarn to engage the adherence zone of the tube and to allow an end portion of the yarn extending axially outward of the tube to engage said guide device, and means forming yarn reserve turns before winding the yarn bobbin.

4,084,760

TRANSFERRING YARN IN AN AUTOMATIC WINDER

Tatsuya Nakano, Ichinomiya; Kazuyoshi Yasuda, Nagoya, and Takeshi Miwa, Obu, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1976, Ser. No. 723,905
Claims priority, application Japan, Sep. 25, 1975, 50-114919
Int. Cl.[2] B65H *67/04, 54/34*
U.S. Cl. 242—18 A **2 Claims**



1. A method for transferring a yarn in an automatic winder

of surface driven turret type in which upon transferring a yarn, formation of a transfer bunch and formation of a transfer tail can be achieved without disengaging the yarn from a traverse yarn guide, said method comprising the steps of:

reversely rotating a traverse cam roll at a low speed to bring a traverse guide to a stop at a predetermined position; then

shifting said traverse guide jointly with said traverse cam roll to make said yarn contact with a yarn gripping device provided at an end of an empty bobbin or an empty bobbin holder;

winding said yarn around an empty bobbin on said empty bobbin holder after having cut the yarn extending to a previously fully wound adjacent bobbin by means of a cutter associated with said yarn gripping device;

restoring said traverse cam roll to its normal position by reversely performing said shifting, forming a bunch winding at a predetermined position on said empty bobbin;

forming a transfer tail by rotating said traverse cam roll in a normal direction opposite to that of said reversely rotating, but still at a low speed, after said bunch winding has been formed, to displace said traverse guide at a low speed from said predetermined position to a normal traverse movement region; and

switching the speed of said traverse cam roll to a higher speed and pressing said empty bobbin against a drive roll to carry out surface drive type of winding when said traverse guide has come to said normal traverse movement region.

2. In a turret type automatic winder for winding yarn on bobbins on a succession of bobbin holders to fill each bobbin and transfer to winding on the respective next bobbin, the winder having:

a turret;

means mounting the turret for indexing;

a plurality of bobbin holders projecting from the turret;

a drive roll mounted beside the turret for rotation in driving relation with the respective one of said bobbin holders nearest the drive roll;

a traverse yarn guide for guiding a feed of yarn onto a bobbin on the bobbin holder being rotated by the drive roll;

means associated with each bobbin holder for gripping the yarn at the initiation of winding onto the bobbin thereon;

a traverse cam roll for traversing the traverse yarn guide;

means for rotating the traverse cam roll to traverse the traverse yarn guide;

a cutter associated with the yarn gripping device for cutting the yarn extending between a bobbin which has become fully wound and a next-to-be-wound empty bobbin, once the yarn has been gripped by yarn gripping means associated with the bobbin holder that is holding said next-to-be-wound empty bobbin;

the provision of means for forming a transfer bunch and a transfer tail when transferring from winding yarn on a bobbin which as become fully wound, to a next-to-be-wound empty bobbin on one of said bobbin holders, comprising:

means for reversely rotating the traverse cam roll at low speed to bring the traverse guide to a stop at a predetermined position;

means for shifting the traverse guide jointly with the traverse cam roll in one direction along the longitudinal axes thereof to make the yarn contact said yarn gripping device, and for then shifting the traverse cam roll longitudinally back to a normal position to form a bunch winding at a predetermined position on the empty bobbin;

means for rotating the traverse cam roll in a normal direction at low speed, after the bunch winding has been formed, to displace the traverse guide at a low speed from said predetermined position, to a normal traverse movement region;

and means for switching the speed of rotation of the traverse cam roll to a higher speed and for then pressing the drive roll against the empty bobbin to carry out surface drive winding when the traverse guide has come to said normal traverse movement region.

4,084,761

ROLL SUPPORT ASSEMBLY

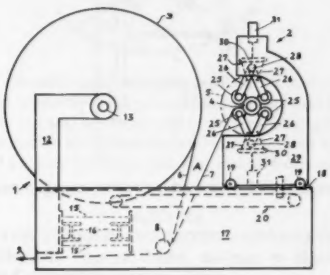
Gustav Kuckhermann, Fautenbacher Strasse 24, Achern, Germany

Filed Jun. 16, 1976, Ser. No. 696,829

Claims priority, application Germany, Jun. 16, 1975, 2526962

Int. Cl.[2] B65H *19/12, 17/12*

U.S. Cl. 242—58.6 **8 Claims**



1. A roll support assembly for supporting webs wound in separate supply rolls and the ends of which are to be joined to produce a continuous web, comprising: a main support comprising two support arms and two mandrels, one of the mandrels mounted on each of the support arms, the mandrels adapted to support the axial ends of each newly loaded supply roll; an auxiliary support to which each supply roll may be transferred when partly expired to enable a further supply roll to be loaded on the main support, the auxiliary support comprising at least one group of rollers adapted to engage the peripheral surface of the supply roll and means for mounting the rollers in such a manner as to be movable by mutually equal amounts towards and away from a base frame connecting the main and the auxiliary supports; the axis of the supply roll and means on the auxiliary support to provide relative movement of the main and auxiliary supports on the base frame such that a partly expired roll may be simultaneously supported by both supports.

4,084,762

ARRANGEMENT FOR THE AUTOMATICALLY RELEASABLE AFFIXATION OF REELS ON ROTATABLE HUBS

Arno Repp, Darmstadt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 18, 1977, Ser. No. 778,888

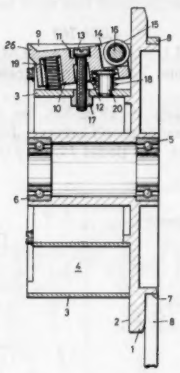
Claims priority, application Germany, Mar. 20, 1976, 2612019

Int. Cl.[2] B65H *17/02*

U.S. Cl. 242—68.3 **11 Claims**

1. Arrangement for the releasable mounting of a reel on a rotatable hub, comprising a take-up means having an external diameter corresponding to the borehole diameter of the reel, a plurality of gripping lever means resiliently mounted within said take-up means at predetermined distances between each other, said gripping lever means extending parallel to the axis of rotation of said take-up means, a pair of spring means each being arranged adjacent the opposite extremities of said gripping lever means and being biased radially in outward direction, and means supporting said gripping lever means approximately at the center portion thereof in a rotatable manner, whereby during mounting of the reel, an end of the gripping lever means facing away from said hub is travelled over and

when pushing the reel further on over said gripping means, a second end thereof is travelled over and the first end travelled



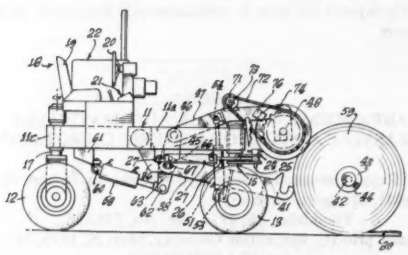
over is forced radially upward in locking engagement with the reel.

4,084,763

MACHINE FOR HANDLING ARTIFICIAL TURF OR THE LIKE

Frank J. Zamboni, Paramount, Calif., assignor to Frank J. Zamboni & Co., Paramount, Calif.

Filed Apr. 5, 1976, Ser. No. 673,449
Int. Cl.[2] B65H *17/46*
U.S. Cl. 242—86.52 15 Claims



1. Apparatus for handling a strip of artificial turf or the like comprising

a wheeled carrier,

means for driving said carrier over the ground,

spaced support members on said carrier for supporting the opposite ends of a mandrel on which a roll of said strip is to be wound or unwound,

means for raising or lowering said support members relative to said carrier whereby to raise or lower said roll,

a roller carried by said carrier for frictionally engaging the periphery of said roll, and

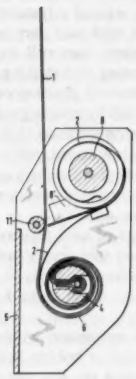
drive means on said carrier for rotating said roller whereby to wind said strip.

4,084,764

DEVICE FOR WINDING UP A BELT OR WEB

Heinrich Mögerlein, and Werner Moser, both of Augsburg, Germany, assignors to Fa. J. N. Eberle & Cie. GmbH, Augsburg, Germany

Filed Apr. 20, 1977, Ser. No. 789,260
Claims priority, application Germany, Apr. 28, 1976, 2618714; May 19, 1976, 2622176; Aug. 9, 1976, 2635771; Aug. 9, 1976, 2635770
Int. Cl.[2] A65B *35/00;* B65H *75/48*
U.S. Cl. 242—107 26 Claims



1. A safety-belt dispenser comprising:

a holder;

a roller journaled in said holder;

a belt anchored to said roller and partly wound therearound, said belt being unwindable from said roller along a predetermined path during a pull-out stroke;

a driving spring mounted on said holder and coupled with said roller for exerting thereupon a restoring force tending to rewind said belt during a retraction stroke;

a resilient ribbon at least partly interleaved with said belt about said roller in a rewound state of said belt, said ribbon being inherently stressed for superimposing a biasing force upon said restoring force during certain phases of said strokes to subject said belt to a rewinding force of relatively high value during an initial part and of a relatively low value during a terminal part of a pull-out stroke;

retaining means disposed alongside said path for storing said ribbon in coiled form apart from said belt upon separation of said ribbon and said belt during said pull-out stroke; and

guide means for directing said ribbon from said roller to said retaining means.

4,084,765

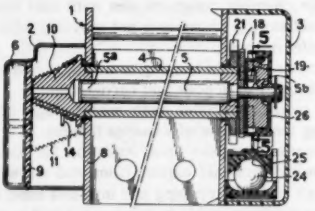
WINDING DEVICE, IN PARTICULAR FOR A VEHICLE SAFETY BELT

Michel Bonnaud, Montbeliard, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of France

Filed Dec. 23, 1975, Ser. No. 643,770
Claims priority, application France, Dec. 24, 1974, 74 42706
Int. Cl.[2] B65H *75/48;* A62B *35/02*
U.S. Cl. 242—107.4 B 2 Claims

1. In a device for winding a safety belt, in particular for an automobile vehicle, comprising a fixed housing, a drum which is mounted in the housing to rotate about an axis and to which drum one end of the belt is fixed, at least one elastically yieldable return means for biasing said drum in a belt retraction direction, a shaft mounted to rotate about an axis parallel to the axis of the drum, the return means being disposed between the housing and the shaft, a first pulley integral with the drum, a second pulley integral with the shaft, each pulley having a

diameter increasing from one end of the pulley to the other end of the pulley and defining a helical groove, the two pulleys being oriented in opposite directions, and a transmission cable fixed at each of its ends to each one of the pulleys, the elastically yieldable return means being drivingly connected to said shaft; the improvement comprising in combination a means for blocking the drum against rotation, a rotatable cylindrical



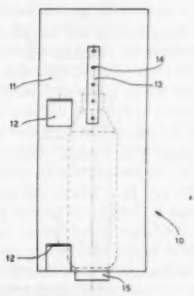
pulley having an axis parallel to the axis of the drum and around which cylindrical pulley the cable passes in its path between the two pulleys, an input shaft integral with said cylindrical pulley and means responsive to acceleration of said input shaft beyond a threshold value of acceleration for actuating said blocking means whereby said input shaft acceleration is directly proportional to the linear acceleration of the belt.

4,084,766

DEVICE TO DISRUPT THE BALLOON OF YARN

Claudio Speranzin, Pordenone, Italy, assignor to Officine Savio, S.p.A., Pordenone, Italy

Filed May 11, 1976, Ser. No. 685,179
Claims priority, application Italy, May 20, 1975, 83378 A/75
Int. Cl.² B65H *49/00*; D01H *13/04*
U.S. Cl. 242—129.62 **4 Claims**



1. A device to disrupt the balloon, which is suitable for coupling to cops being unwound in a winding machine, comprising in reciprocal coordination and cooperation a cylindrical section positioned eccentrically to the axis of the cop and extending at least the whole height of said cop, a thread guide, and means mounted on said cylindrical section for adjustably supporting the guide above the cop.

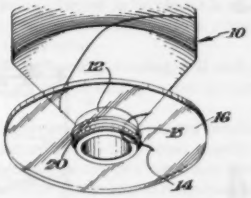
4,084,767

TEXTILE BOBBIN WITH YARN END FASTENING MEANS

Alan Caywood Witt, Chattanooga, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1977, Ser. No. 783,731
Int. Cl.² B65H *55/00*, *75/28*
U.S. Cl. 242—164 **3 Claims**

1. In combination, a tubular textile bobbin having yarn wound thereon with an unwound end of yarn extending to one end of the bobbin, and a rigid disc having a flat surface substantially normal to the axis of the tubular bobbin extending substantially beyond the peripheral surface of said bobbin said disc having a central opening through which said one end of the bobbin and said unwound end of yarn extends, said opening



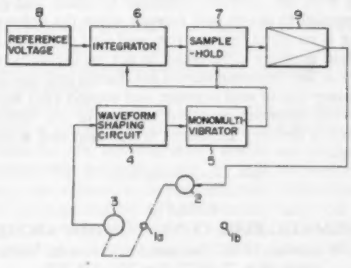
having a diameter relative to the diameter of said one end of the bobbin to enable the disc to slidably engage said one end of the bobbin and said unwound end of yarn extending to said one end of the bobbin to frictionally hold said unwound end of yarn in a fixed position between said disc and said one end.

4,084,768

TAPE TENSION IMPARTING APPARATUS

Kiyoshi Hayashi, Nagoya, Japan, assignor to Shin-Shirasuna Electric Corporation, Nagoya, Japan

Filed Feb. 7, 1977, Ser. No. 766,544
Claims priority, application Japan, Feb. 20, 1976, 51-17727
Int. Cl.² G11B *15/54*, *15/30*
U.S. Cl. 242—186 **1 Claim**

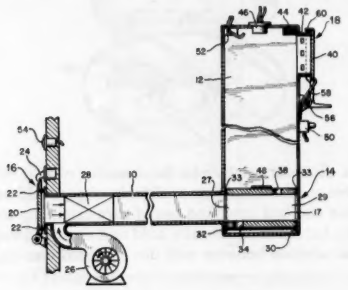


1. An apparatus for imparting a predetermined tension to a tape transported at a predetermined velocity from one to the other of reels mounted on a pair of reel spindles at least one of which is rotated by a motor to have a rotational torque imparted thereto, said apparatus comprising detector means associated with said reel spindle for providing a signal having a frequency proportional to the number of revolutions of said reel spindle, a multivibrator circuit adapted to provide, in response to said signal from said detector means, an impulse having a frequency corresponding to the period of said signal, an integration circuit adapted to be reset by said impulse, a sample-hold circuit adapted to be sampled by said impulse and having the output thereof connected to said motor, and a reference voltage source connected to said integration circuit, wherein a saw-tooth wave having a period equal to that of said signal available from said detector means is produced at the output side of said integration circuit, said integration circuit being reset by the impluse derived from said multi-vibrator circuit, said saw-tooth wave being applied to said sample-hold circuit so that a signal corresponding to the peak value of said saw-tooth wave is provided at the output side of said sample-hold circuit, the last-mentioned signal being one corresponding to the reciprocal of said number of revolutions which corresponds to the period of revolution of said reel spindle, and the signal provided at the output side of said sample-hold circuit is applied to said motor, whereby a predetermined tension is imparted to the tape.

4,084,769
PNEUMATIC DELIVERY SYSTEM

Tommy N. Tyler, 1110 Par Rd., Broomfield, Colo. 80020, assignor to Powers Regulator Company, Denver, Colo.

Filed Dec. 10, 1976, Ser. No. 749,376
Int. Cl.[2] B65G 51/30
U.S. Cl. 243—3 14 Claims

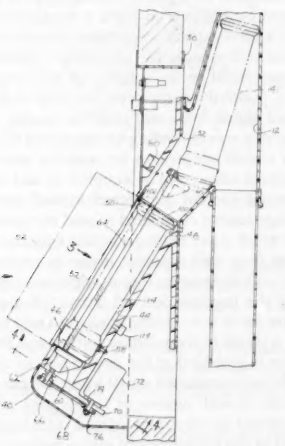


1. A pneumatic delivery system comprising:
a first conduit;
a second conduit communicating with said first conduit;
means for creating a pressure differential in said conduits;
a capsule disposed within said second conduit for movement between said first conduit and a receiving station, said capsule including chamber means for receiving a delivery container at said first conduit, first port means for cooperating with the delivery container to cause said pressure differential to act on said capsule when the delivery container is received therein from said first conduit for causing said pressure differential to act on the delivery container at the receiving station for discharging the delivery container out of said capsule, and second port means for allowing upstream pressure to pass to the atmosphere when the delivery container is not disposed within said capsule.

4,084,770
PNEUMATIC TUBE CONVEYOR DISPATCHER

Bruno D. Warmann, 15362 Fairlane Dr., Livonia, Mich. 48154

Filed Mar. 7, 1977, Ser. No. 775,257
Int. Cl.[2] B65G 51/28
U.S. Cl. 243—25 6 Claims

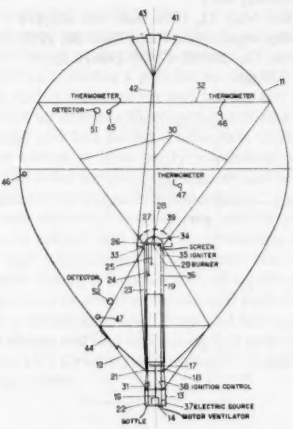


1. A pneumatic tube conveyor dispatcher for converting a free dispatch system to a controlled dispatch system and wherein the free dispatch system has an inlet opening through which a carrier may be inserted for passage into the delivery tube of the pneumatic system, said pneumatic tube conveyor dispatcher comprising:
a housing having a non-movable storage chamber for the receipt of said carrier, said housing having means for mounting said housing to said inlet opening such that said storage chamber communicates with said inlet opening and said storage chamber is not movable with respect to said inlet opening;
a door carried by said housing to permit access to said storage chamber to deposit said carrier therein;
sensing means associates with said storage chamber for sensing the presence of a carrier therein;
drive means responsive upon actuation for acting on said carrier to eject said carrier from said storage chamber through said inlet opening and into said tube; and
actuating means operable in response to said sensing means for actuating said drive means.

4,084,771
HOT AIR AEROSTAT

Robert Armand Creuzet, Marmande, France

Filed Mar. 25, 1976, Ser. No. 670,563
Claims priority, application France, Mar. 27, 1975, 75 09709; Mar. 17, 1976, 76 07714
Int. Cl.[2] B64B 1/62
U.S. Cl. 244—31 8 Claims

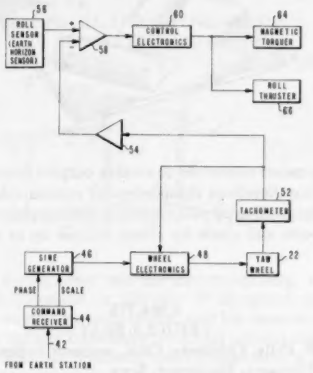


1. A hot air aerostat comprising: an envelope, a closable valve member disposed in said envelope, said envelope and valve member defining a substantially closed volume of air when said valve member is in its closed state; a nacelle attached to said envelope; a burner having an operational state disposed inside said volume of air to heat the air contained in said envelope, said burner being disposed at a relatively large distance from said envelope when in said operational state; a fuel tank disposed in said nacelle, said fuel tank being connected to said burner; ignition means disposed in the vicinity of said burner; a fan to blow air from the external atmosphere into said envelope through said valve member, said valve member comprising a rigid member defining an aperture in said envelope and a flexible sleeve member having an end projecting into said aperture, said flexible sleeve member having extended and collapsed state, said sleeve member closing said aperture when in said collapsed state, and being extendible into said volume of air under activation of said fan.

4,084,772
ROLL/YAW BODY STEERING FOR MOMENTUM BIASED SPACECRAFT

Ludwig Muhlfelder, Livingston, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,014
Int. Cl.[2] B64G *1/10*
U.S. Cl. 244—165 **7 Claims**



1. A control system for an orbiting pitch momentum biased satellite, said satellite having a pitch, roll, and yaw axis, and wherein the momentum of said satellite is defined by a momentum vector,

said satellite being adapted to be placed in an orbit defining a plane that is inclined relative to a plane containing a geo-synchronous orbit,

said inclination inherently causing roll and yaw pointing errors with respect to said geo-synchronous orbit, comprising:

a. a transverse wheel mounted parallel to said yaw axis and adapted for bi-directional rotation and varying speed,

b. means for rotating said wheel in accordance with a predetermined rate schedule which varies sinusoidally over the orbit at the orbital frequency of the satellite whereby the attitude of said satellite is offset in response to the effect of said rotating wheel by the direction of the pitch axis being changed with respect to said momentum vector, the direction of said pitch axis with respect to the inclined orbit normal varying sinusoidally at the orbital frequency to null said roll pointing error due to said orbit inclination, the momentum vector being maintained perpendicular to the plane of the geo-synchronous orbit to null said yaw pointing error due to said orbit inclination,

c. means responsive to said transverse wheel when rotating for generating a signal indicative of the speed and direction of said wheel,

d. attitude sensing means for generating an attitude error signal indicative of an error in desired roll attitutde relative to said inclined orbit,

e. means responsive to said roll attitude error signal to orient said satellite by altering the inertial direction of said momentum vector,

f. said orientation means including means reponsive to said wheel speed and direction signal for modifying said attitude error signal to be non-responsive to said offset in attitude generated by said transverse wheel, said attitude offset being in addition to said roll attitude errors,

said attitude offset due to said rotating transverse wheel having a predetermined relation to said inclination,

whereby the yaw pointing errors due to said inclination are substantially reduced to zero by said momentum vector being repositioned to be perpendicular to the plane of said geo-synchronous orbit, and

whereby the roll pointing errors due to said inclination are reduced substantially to zero by the rotation action of said transverse wheel.

7. A method for controlling the pointing of an orbiting pitch momentum biased satellite, said satellite having a pitch, roll, and yaw axis, and wherein the momentum of said satellite is defined by a momentum vector,

said satellite being adapted to be placed in an orbit defining a plane that is inclined relative to a plane containing a geo-synchronous orbit,

said inclination inherently causing roll and yaw pointing errors with respect to said geo-synchronous orbit, comprising:

a. rotating a transverse wheel mounted parallel to said yaw axis and adapted for bi-directional rotation and varying rate in accordance with a predetermined sinusoidal schedule over the orbit at the orbital frequency of the satellite, whereby the attitude of the satellite is offset in response to the effect of said rotating wheel by the direction of the pitch axis being changed with respect to said momentum vector, the direction of said pitch axis with respect to the inclined orbit normal varying sinusoidally at the orbital frequency to null said roll pointing error due to said orbit inclination, the momentum vector being maintained perpendicular to the plane of the geo-synchronous orbit to null said yaw pointing error due to said orbit inclination,

b. generating a signal indicative of the speed and direction of said wheel,

c. detecting an error in desired roll attitude relative to the inclined orbit,

d. generating a signal indicative of said error in roll attitude,

e. orienting said satellite in response to said roll attitude error signal by altering the inertial direction of said momentum vector,

f. modifying said attitude error signal to be non-responsive to said offset in attitude generated by said transverse wheel, said roll attitude offset being in addition to said roll attitude errors,

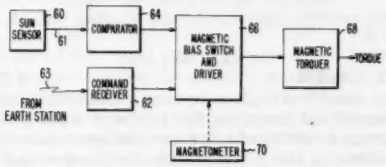
said attitude offset due to said rotating transverse wheel having a predetermined relation to said inclination,

whereby the yaw pointing errors due to sain inclination are substantially reduced to zero by said momentum vector being repositioned to be perpendicular to the plane of said geo-synchronous orbit, and whereby said roll pointing errors due to said inclination are reduced substantially to zero by the rotation action of said transverse wheel.

4,084,773
MAGNETIC CONTROL OF SPACECRAFT ROLL DISTURBANCE TORQUES

George Edwin Schmidt, Jr., Delran, and Ludwig Muhlfelder, Livingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 613,094, Sep. 15, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,866
Int. Cl.[2] G06F *15/50*; B64G *1/10*
U.S. Cl. 244—166 **15 Claims**



1. A method for torquing a momentum biased spacecraft to compensate for predicted roll disturbance torques caused substantially by solar radiation pressure on the spacecraft to minimize the yaw rotational deviation of the pitch axis from a desired attitude parallel to the orbit normal, said pitch axis

being collinear with the momentum vector of said spacecraft, comprising the steps of:

a. sensing without sensing yaw errors, the declination of the sun by sensor means mounted on said spacecraft for generating in response to solar energy a signal representing the declination of the sun,

b. generating in response to said sensor output signal a logic output signal by logic means coupled to said sensor means, said logic signal representing a desired magnetic dipole strength,

c. generating in response to said logic output signal a signal for energizing magnetic torquing means by energizing means coupled to said logic means,

d. magnetic torquing said spacecraft by energizing said torquing means to produce a magnetic dipole substantially parallel to the yaw axis of said spacecraft such that the magnetic field therefrom reacts with the magnetic field of the earth to produce a magnetic torque substantially of equal magnitude and opposite direction to said predicted roll disturbance torques to thereby minimize the deviation of said pitch axis.

7. A torquing system for a momentum bias spacecraft to compensate for predicted roll disturbance torques and thereby minimize the yaw rotational deviation of the pitch axis from a desired attitude parallel to the orbit normal, said spacecraft being of the dual-spin type having a momentum wheel, said pitch axis being collinear with the momentum vector of said spacecraft, comprising:

a. magnetic torquing means oriented in said spacecraft to produce when energized a magnetic dipole substantially parallel to the yaw axis of said satellite,

b. sensor means mounted on said spacecraft for generating in response to solar energy a signal representing the declination of the sun,

c. logic means coupled to said sensor means for generating in response to said sensor output signal a logic output signal, said logic signal representing a desired magnetic dipole strength; and

d. energizing means coupled to said logic means for generating in response to said logic output signal signals for energizing said magnetic torquing means such that the magnetic field therefrom reacts with the magnetic field of the earth to produce a magnetic torque substantially of equal magnitude and opposite direction to said roll disturbance torques to thereby minimize the deviation of said pitch axis,

said torquing means comprising first, second, and third air core coils, said first coil being energized to develop either of two magnetic field strengths, said second and third coils being energized to develop a magnetic field equal in strength to the maximum magnetic field developed by said first coil.

4,084,774

REDUNDANT OFF-AXIS SENSOR ASSEMBLIES

David Kimberley, Fleet, England, assignor to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

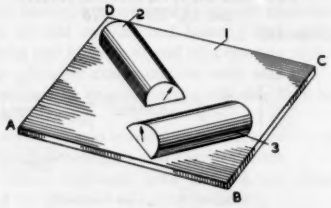
Filed Jul. 12, 1976, Ser. No. 704,262

Claims priority, application United Kingdom, Jul. 15, 1975, 29617/75

Int. Cl.[2] G05D *1/00*

U.S. Cl. 244—194 **4 Claims**

1. An assembly of single-component motion sensors installed in an aircraft and comprising four groups of two sensors, said four groups consisting of a first group of two sensors having their measuring axes parallel and in the direction (α,β,γ), a second group of two sensors having their measuring axes parallel and in the direction $(-\alpha,\beta,\gamma)$, a third group of two sensors having their measuring axes parallel and in the direction $(-\alpha,-\beta,\gamma)$, and a fourth group of two sensors having their measurement axes parallel and in the direction $(\alpha,-\beta,\gamma)$, said directions being expressed relative to three orthogonal axes parallel to the pitch, roll and yaw axes respectively of the aircraft, and α,β, and γ being three nonzero numbers the sum of whose squares is equal to unity, the sensors being arranged 40 pairs, different pairs being installed in different locations in the aircraft, no pair having two sensors in the same group, and



resolving means connected to receive outputs from the sensors for deriving therefrom components of motion relative to said three orthogonal axes, said resolving means being operative to detect, locate and allow for sensor failures up to two in number.

4,084,775

VEHICLE SEAT

Charles W. Pelly, Calabasas, Calif., assignor to Sears Manufacturing Company, Davenport, Iowa

Filed Sep. 17, 1976, Ser. No. 724,164

Int. Cl.[2] A47C *7/02*

U.S. Cl. 297—453 **3 Claims**

1. A vehicle seat comprising:

a base shell member having forward and upright portions;

foam means; and

cover means having a seat portion and a back portion, said cover means being attached to said base shell member, said foam means being disposed between said base shell member and said cover means, said back portion being disposed over said upright portion, said seat portion being disposed over said forward portion, said seat portion having formed thereon drainage means, said back portion having formed thereon cross-ventilation means, said drainage means including a primary transverse channel, a plurality of secondary transverse channels, a pair of longitudinal connecting channels, and a pair of drainage grooves, said longitudinal connecting channels being disposed adjacent said seat portion's longitudinal edges and joining said secondary transverse channels to said primary transverse channel, said primary transverse channel at each end thereof communicating with one of said drainage grooves, said secondary transverse channels sloping downwardly toward said longitudinal connecting channels, said longitudinal connecting channels sloping downwardly toward said primary transverse channel, said primary transverse channel sloping downwardly toward said drainage grooves, each drainage groove sloping downwardly and away from said primary transverse channel and through one of said seat portion's longitudinal

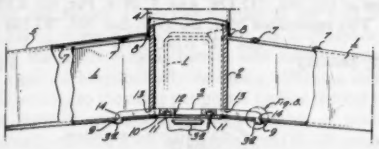
edges, whereby water is carried over the seat portion's longitudinal edges and off of said cover means.

4,084,776

FURNITURE BASE AND METHOD OF MAKING THE SAME

Donald W. Cook, Telford, Pa., assignor to Cook Specialty Company, Green Lane, Pa.

Filed Jan. 21, 1976, Ser. No. 651,320
Int. Cl.[2] F16M 11/20
U.S. Cl. 248—188.7 13 Claims



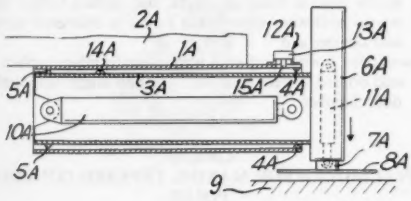
1. A base for furniture and the like comprising; a hollow central vertical column, a plurality of elongated metal leg elements for supporting said column, said leg elements extending generally radially outwardly from said column and having spaced apart walls of relatively thin cross-section, a load-distributing spider mounted on said vertical column near the bottom thereof and having a center portion and arms radiating outwardly from the center portion and from the column, said center portion fitting within said hollow central vertical column and being welded to said column, means interconnecting said leg elements to said arms, and said arms welded to said leg elements at points adjacent the ends of the arms.

4,084,777

STABILIZING APPARATUS INCORPORATING TELESCOPIC STRUCTURES

Bernard Léon Lambert, Monteceau les Mines, France, assignor to Societe Anonyme Potain Poclain Materiel (P.P.M.), France

Filed Jan. 19, 1977, Ser. No. 760,655
Claims priority, application France, Jan. 27, 1976, 76 02146
Int. Cl.[2] B60S 9/12, 9/00
U.S. Cl. 248—287 2 Claims



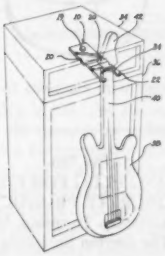
1. In a telescopic structure
an inner telescopic part,
an outer telescopic part receiving telescopically the inner telescopic part,
an arm capable of accommodating a thrust in a predetermined direction different from the direction of the telescopic action and connected to one of the two telescopic parts and being mounted on said inner telescopic part,
a position-detector including
a casing and
a movable member, the casing being secured to one of the telescopic parts,
a projection secured to the other of the telescopic parts, the projection being disposed to operate the movable member,
the movable member being effectively actuable only in a single predetermined relative position of the two telescopic parts and in which a thrust is exerted on the said arm in the said direction and the projection is disposed opposite to the movable member and is moved towards the movable member by a displacement in a direction substantially the same as the thrust direction, the inner part carrying the thrust arm being subject to the action of the said thrust.

4,084,778

BRACKET FOR SUPPORTING STRINGED MUSICAL INSTRUMENTS

Richard Lee Dominguez, 3835 W. Eva Ave., Phoenix, Ariz. 85021

Filed Oct. 20, 1976, Ser. No. 734,342
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—314 4 Claims



1. A bracket to be secured to a cabinet for hanging musical instruments therefrom comprising a rigid member having a first substantially flat coplanar section, a second section integral with said first section and extending angularly upwardly from said first section, and a third substantially flat coplanar section integral with and extending from said second section and in parallel, elevated relationship to said first section, said first, second, and third sections being in mutual alignment, said first section including a centrally located aperture for receiving attachment means to pivotally attach said bracket to the top of said cabinet, said third section comprising opposing coplanar curved jaw members having a smooth, relatively soft surface, said jaw members defining an orifice between said jaw members, said orifice comprising a neck portion and a main portion, said neck portion providing a constricted exterior entrance to said main portion.

4,084,779

POT HANGER

Hubert J. Moineau, Bolton, Mass., assignor to Automatic Specialties, Inc., Marlboro, Mass.

Filed Dec. 31, 1975, Ser. No. 645,808
Int. Cl.[2] F16M 13/00; A47G 7/00
U.S. Cl. 248—318 11 Claims

1. An improved hanger for planters, which hanger comprises in combination:
(a) a supporting wire element having a hook-like shape at the one end, a straight-line shank portion at the other end and an angular portion therebetween;
(b) a plurality of stringer wire elements, each having a one end and another end, the other end of each of the wire elements free and adapted to secure and support an object, such as a planter, therefrom; and
(c) a helical coil formed of the plurality of the stringer wire elements at the one end and wrapped tightly about the one end of the supporting wire element and about at least a

portion of the straight shank section and angular portion of the supporting element, the helical coil securing the

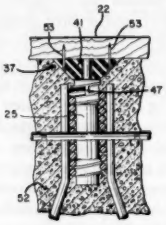
plurality of stringer wire elements to the supporting element.

4,084,780

CAVITY FORMING PLUG FOR COIL INSERT IN CONCRETE PRODUCT

Richard C. Mess, Washington Township, Montgomery County, Ohio, assignor to The Dayton Sure-Grip & Shore Company, Miamisburg, Ohio

Filed Jan. 21, 1977, Ser. No. 761,262
Int. Cl.[2] B28B *7/30*
U.S. Cl. 249—59 **12 Claims**



1. A plug assembly for temporary use with a concrete product insert including a coil defining an interior threaded surface, which insert is to be held in position adjacent a mold wall by said plug assembly during the pouring of a concrete product, comprising:

(a) a plug including

a hollow cylindrical, elastomeric body defining a cavity and an opening thereto at one end of said body, said body closed at the other end thereof, and said body having an outer surface proportioned and threaded for firm matching engagement with said threaded coil interior surface upon predetermined radial compression and axial expansion from the substantially unstressed condition of said elastomeric body, and

a stem in said cavity attached to said body internally at said closed end thereof and extending out of said cavity through said opening a distance sufficient to provide for use of said stem as a handle for applying a pulling force internally of said plug to said closed end thereof, and

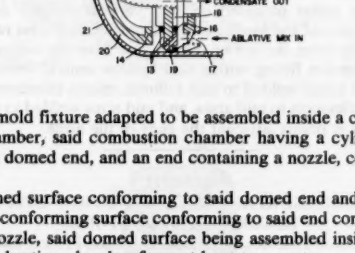
(b) support means having a first portion inserted into said cavity through said opening and a second portion for attachment to a mold wall such that said support means may be removed from said cavity as said mold wall is removed from said concrete product and said plug may be thereafter removed from said coil by applying a pulling force to said stem.

4,084,781

FABRICATION OF ABLATOR LINERS IN COMBUSTORS

Harold Thompson Couch, Columbia; Leonard Selwyn Cohen, West Hartford, and Lawrence Joseph Coulter, South Windsor, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 712,128, Aug. 5, 1976, Pat. No. 4,031,605.
This application Mar. 28, 1977, Ser. No. 782,102
Int. Cl.[2] B29C *1/00*
U.S. Cl. 249—83 **3 Claims**



1. A mold fixture adapted to be assembled inside a combustion chamber, said combustion chamber having a cylindrical shape, a domed end, and an end containing a nozzle, comprising:

a domed surface conforming to said domed end and a nozzle-conforming surface conforming to said end containing a nozzle, said domed surface being assembled inside said combustion chamber from at least two parts;

a rear wall attached to said domed surface so as to form a cavity therebetween, said rear wall containing openings to allow steam into and out of said cavity;

a surface conforming to said combustion chamber end containing a nozzle, said surface being assembled inside said nozzle from at least two parts; said surface further defining an enclosure into which steam is delivered through said nozzle; and

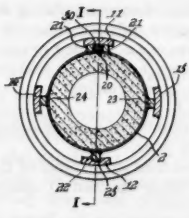
means for positioning said nozzle-conforming surface and said domed surface in a fixed position inside said combustion chamber.

4,084,782

SPLIT MOULD FOR MAKING TAPERED CONCRETE POLES

Senri Okada, Tokyo, Japan, assignor to Nippon Concrete Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1976, Ser. No. 754,741
Int. Cl.[2] B28B *21/82*
U.S. Cl. 249—135 **4 Claims**



1. A mould structure for use in making tapered concrete

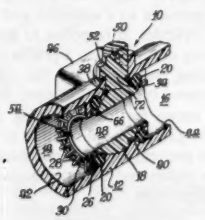
poles, comprising: a tapered outer frame essentially consisting of a plurality of longitudinal guide members (11–14) radially arranged about a common axis and each inclined to the axis at an angle corresponding to the taper of concrete poles to be formed, the mould structure having a longitudinally extending mould axis, a plurality of annular connecting members (10) axially spaced from each other and each secured to said guide members in their respective angular positions spaced apart from each other, and at least one annular drive wheel (3) secured to said guide members in encircling relation thereto; and a frustoconical tubular casing (2) of resilient steel sheet material formed with the same taper as that of said outer frame so as to be inserted in said outer frame substantially coaxially therewith and having a gap (20) formed in the wall of said tubular casing along a longitudinal line on its periphery and extending the entire length thereof, said tubular casing (2) having a pair of longitudinally extending stiffening members (21—21) secured to the outer peripheral surface thereof on the opposite sides of said gap (20) and a number of additional longitudinally extending stiffening members (22–24) secured to said outer peripheral surface in spaced relation to each other and to said pair of stiffening members (21—21), all of said stiffening members (21–24) being placed in contact with the respective guide members (11–14) of said outer frame for sliding movement therealong so that said gap (20) is opened and closed as said tubular casing (2) is moved axially in opposite directions relative to said outer frame.

4,084,783

MOLDING TOOL FOR MAKING VALVE

Thomas J. Wrasman, 12500 Ridge Rd., Louisville, Ky. 40223

Division of Ser. No. 635,256, Nov. 25, 1975, Pat. No. 4,038,358.
This application Feb. 16, 1977, Ser. No. 768,964
Int. Cl.² B29C *1/06*
U.S. Cl. 249—175 **3 Claims**



1. A tool for use in molding a plastic valve housing about a preformed valve component having a flow bore therethrough said tool comprising:

a shank portion for defining a bore in said housing;

an insert portion for insertion into said flow passageway of said preformed component; and

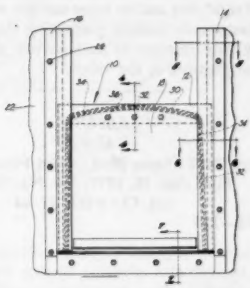
a plurality of spaced retaining fingers spaced about said insert portion for securing a seal against said preformed valve component during molding of the housing thereabout, said insert portion serving to align said valve component and to restrict liquid plastic from entering and clogging the bore during molding, and the spaces between said fingers and between said fingers and said insert portion being filled with plastic during molding to define a retainer portion which holds the seal tightly against the preformed valve component after the tool is withdrawn.

4,084,784

SLIDE GATE SEALING CLOSURE

Camille A. Labelle, Greenfield Park, Canada, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 27, 1977, Ser. No. 762,979
Claims priority, application Canada, Feb. 16, 1976, 245778
Int. Cl.² F16K *51/00*
U.S. Cl. 251—147 **9 Claims**



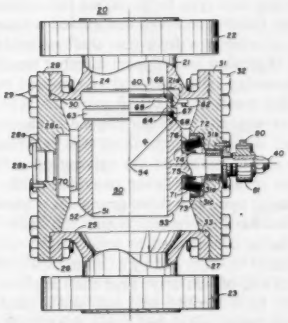
1. In a gate assembly of the type having a frame with a sill and an opening for the passage of a fluid, and a gate slide mounterd on said frame for movement toward and away from said sill, between open and closed positions, the improvement, in combination therewith, comprising a first flange projecting from said frame on both sides of said opening, a resilient sealing member fixed to said first flange, and a second flange substantially identical to said first flange projecting from the back side of said gate slide, said first and second flanges being so positioned that, when said gate slide is in the closed position against said sill, said first and second flanges overlap and said resilient sealing member is compressed so as to produce a water tight seal, whereby sealing is accomplished by a compression of said resilient sealing member between said first and second flanges when said gate slide is substantially closed, thus virtually eliminating frictional wear of said resilient sealing member.

4,084,785

BALL VALVE WITH LINEAR ELASTOMERIC SEAL MOUNTING

John T. Herbert, Arlington; Paul E. Sullivan, Euless, both of Tex., and Stanley P. Vitt, Jr., Redlands, Calif., assignors to Murdock Machine & Engineering Company of Texas, Irving, Tex.

Filed Aug. 9, 1976, Ser. No. 712,515
Int. Cl.² F16K *41/00, 3/22*
U.S. Cl. 251—172 **14 Claims**



1. In a ball valve where a housing with input and output ports containing a ported gate having spherical surfaces

mounted for rotation about an axis perpendicular to the axis of one of said ports, the combination comprising:

(a) a retainer ring fixedly mounted coaxially of said input port,

(b) a rigid ring with a sealing face ring contoured to mate with said spherical surface of said gate, said rigid ring and sealing ring being responsive to internal valve pressure to increase the contact force between said sealing ring and said ported gate, and

(c) an elastomeric element bonded between the outer surface of said rigid ring and an inner surface of said retainer ring, said elastomeric element permitting the movement of said sealing ring relative to said ported gate in response to internal pressure in the valve.

4,084,786

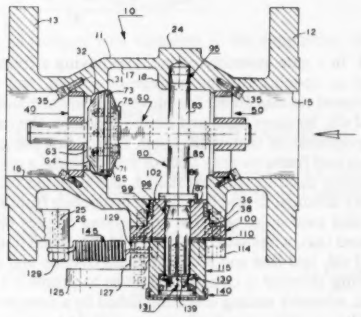
VALVES

Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed Jan. 28, 1977, Ser. No. 763,496

Int. Cl.[2] F16K *31/44*

U.S. Cl. 251—250 **34 Claims**



1. A valve assembly for controlling the flow of liquids and gases comprising an ellipsoidal configuration valve member receiving seat within a valve body shell radially positioned relative to the axis of the valve body, a guided and axially movable valve and stem assembly that has members to provide a seat mating ellipsoidal configuration at valve seating surfaces whereupon straight axial movement is provided for said valve and stem assembly at ellipsoidal valve seating wherein seal material is confined between flange parts of said valve members at a seating area in a manner providing positioning and protection of said seal material, with the valve stem's cylindrical section extending downstream from the valve seating area where it is axially slidably received and guided within a boss supported by the valve body and with said stem's square section having rack type teeth on one face extending upstream to be axially slidably received and guided within a boss supported by the valve body, a drive gear shaft assembly with lubricating seals at alignment and support member junctures with a valve body receiving boss bore and an opposed bore in a retaining flange that positions said shaft parallel to a radial plane providing an arrangement for the aligned engagement of a gear on said shaft with the rack teeth on said valve stem operatable for seating and unseating at the valving operation by the partial rotations of an outer lever provided with a splined hub in engagement upon said drive gear shaft whereupon said hub has lateral outward movement within the limits of a compression spring being compressed to solid height where said spring is contained at its outer end by a flanged shoulder bolt engaged to the outer end of said drive gear shaft applying a reacting force inwardly back through said hub and a quadrant plate to said retaining flange with said drive gear shaft provided with a shoulder that abuts the inner face of said retaining flange substantially limiting said shaft's outward lateral movement as the reacting force of said spring substantially maintains said gear shaft to its inner limits while permitting said outward lateral movement of said hub for the engagement and disengagement of splines on said hub with positioning grooves in said quadrant plate whereby operating lever and valve positioning is substantially maintained as desired with each positioning groove in said quadrant plate while said operating lever is provided with a leverage advantage that upon the applied rotation of said lever said spring compressingly deforms as splines of said hub become disengaged from the grooves of said quadrant plate as said hub is forced laterally outward permitting quick opening and closing valving actions.

4,084,787

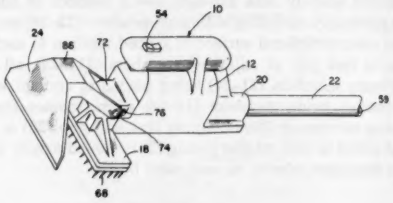
CARPET INSTALLATION TOOL

Adam V. Kowalczyk, 98 Mill Creek Rd., Holland, Pa. 18966

Filed Jun. 14, 1976, Ser. No. 695,362

Int. Cl.[2] A47G *27/04*

U.S. Cl. 254—57 **17 Claims**



1. In a carpet installation tool of the type including a carpet gripper head, the combination of

a frame;

means to move the carpet gripper head relatively to the frame for carpet stretching purposes, said means to move being power actuated,

said means to move comprising elongated means responsive to the power actuation to move the the gripper head forwardly or rearwardly relative to the frame,

said means to move comprising hydraulic circuit means to urge the carpet gripper head forwardly or rearwardly by using hydraulic pressure,

the hydraulic circuit means comprising a pump supplying hydraulic pressure to a cylinder and a piston movable within the cylinder in response to hydraulic pressure,

the piston being connected to a piston rod, the said piston rod extending outwardly of the cylinder and being affixed to move the carpet gripper head,

said means to move further including means to prevent rotation of the gripper head relative to the frame

said means to prevent rotation comprising at least a portion of the piston rod being non-circular in cross sectional configuration.

4,084,788

CLUTCH CONTROL DEVICE FOR CABLE TRACTION APPARATUS

André Desplats, Boulogne-Billancourt, and Michel Cavalieri, Neuilly sur Marne, both of France, assignors to Tractel S.A., Bagnolet, France

Filed Apr. 26, 1977, Ser. No. 791,103

Claims priority, application France, Apr. 29, 1976, 76 12740

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—76 **7 Claims**

1. In a traction apparatus of the kind comprising:

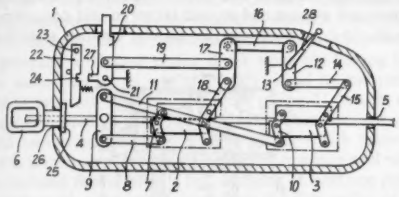
(a) a casing

(b) a pair of movable tandem clamps in said casing adapted to perform a reciprocating movement, said clamps having control links

(c) a release control device having a pair of rocking levers, a first rocking lever of said pair being adapted to perform a rotary motion, the second rocking lever of said pair

being adapted to perform a translatory motion, the improvement which comprises a clutch control device having:

(i) clutch engaging means associated with said first rocking lever and adapted to assume an operative position modifying the movement of said first rocking lever



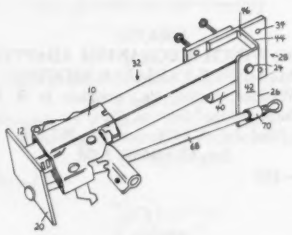
(ii) clutch control means associated with said second rocking lever, said clutch control means when actuated simultaneously with the setting of said clutch engaging means in its operative position causing rotation of said second rocking lever and actuation in unclamping direction of said control links of the pair of clamps.

4,084,789

STABILIZING JACK

Melvin A. Francis, Knoxville, Tenn., assignor to Industrial Drives, Inc., Knoxville, Tenn.

Filed May 31, 1977, Ser. No. 801,608
Int. Cl.[2] B66F *1/06*
U.S. Cl. 254—86 R **5 Claims**



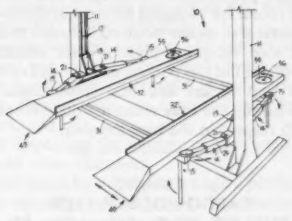
1. In a jack for a ground vehicle including a lever operated jacking mechanism substantially encompassing an elongated rack means, a tubular member affixed at one of its ends to said jacking mechanism and telescopically receiving one end of said rack means therein, ground engaging means pivotally secured to the opposite end of said rack means, bracket means including a channel portion receiving therein said end of said tubular member opposite said jacking mechanism, pivot means securing said tubular member to said channel portion, the improvement comprising means for securing said jack in a generally horizontal storage position comprising an elongated rigid rod, means disposed on said jack at a location spaced apart from said bracket means and defining a first opening for receiving one end of said securing rod and nonpivotal means associated with said bracket means and defining a second opening in proximity with said pivot means for receiving the opposite end of said securing rod, said second opening being spaced from said first opening and of a generally tubular geometry with the longitudinal axis thereof being fixedly oriented substantially horizontally when said jack is in its storage position.

4,084,790

MULTI-PURPOSE VEHICLE SERVICE HOIST

Frank Molnar, 47 Gladys St., Clarence Gardens, South Australia, Australia

Filed Feb. 22, 1977, Ser. No. 770,383
Claims priority, application Australia, Apr. 2, 1976 PC 5471
Int. Cl.[2] B66F *7/10*
U.S. Cl. 254—90 **8 Claims**



1. In a vehicle service hoist of the type having a pair of vertical transversely spaced columns attached to a shallow base member, a lifting carriage on each column guided for vertical movement with respect thereto, a pair of retractable and adjustable lifting arms attached to each carriage, vehicle support means on each arm, lifting means connected to both carriages, and safety means operable to prevent downward movement of the carriages should failure of the lifting means occur, the improvement comprising:

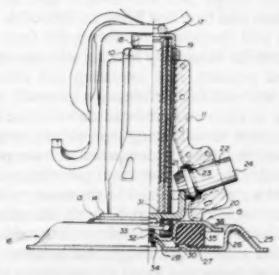
a pair of transversely extending guides positioned one fore and the other aft of the columns, releasable engagement means joining the ends of the guides to corresponding ends of the arms and constructed and arranged so that elevating the arms will effect corresponding elevation of the guides, and a pair of longitudinally extending tracks transversely spaced from each other supported by the guides.

4,084,791

RESILIENTLY FOUR-WAY TILTABLE VEHICLE JACK BASE

Oatway Margueratt, Orillia, Canada, assignor to Seeburn Metal Products Limited, Beaverton, Canada

Filed Jun. 23, 1977, Ser. No. 809,202
Int. Cl.[2] B66F *13/00*
U.S. Cl. 254—101 **5 Claims**



1. A resiliently tiltable load supporting base for vehicle jacks, comprising:

(a) a rectangular metallic base member having a substantially flat bottom with an upwardly extending convex dome formed at the center thereof, said base member having a peripheral stiffening rim including a vertically upwardly extending peripheral wall merging into an outwardly and downwardly flared skirt;

(b) a rectangular metallic load receiving plate having a

substantially flat top with downturned peripheral edges positioned in close proximity to and freely tiltable within said base member vertical peripheral wall and having a socket extending downwardly in a central region of said top, said socket being adapted to receive a vehicle jack and having a bottom wall with a concave depression on the bottom face thereof, said concave depression resting on said base member dome,

(c) a retainer pin member connecting said dome and said concave recess for swinging movement therebetween and

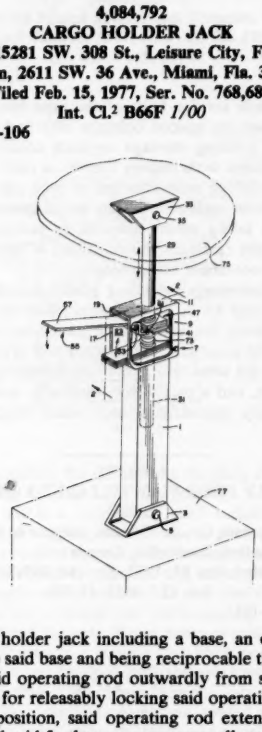
(d) elastomeric slab means mounted between said base member and load receiving plate at least beneath the four corners of the flat top portion of said load receiving plate between said socket and said downturned peripheral edges, whereby the load receiving plate is resiliently tiltable with respect to the base member.

4,084,792

CARGO HOLDER JACK

Raul Baron, 15281 SW. 308 St., Leisure City, Fla. 33030, and Oscar Baron, 2611 SW. 36 Ave., Miami, Fla. 33133

Filed Feb. 15, 1977, Ser. No. 768,680
Int. Cl.² B66F *1/00*
U.S. Cl. 254—106 **4 Claims**



1. A cargo holder jack including a base, an operating rod extending into said base and being reciprocable therein, means for driving said operating rod outwardly from said base, and further means for releasably locking said operating rod in any reciprocated position, said operating rod extending through said means and said further means, a generally enclosed structure having an open end mounted on said base and said means and said further means being operatively mounted thereon, said enclosed structure is composed of two parts, one being received within the other, and the operating rod extends therethrough and a member is fixed to the upper wall of the part of the structure which is received within the other part thereof and said member extends therefrom into said structure, said operating rod extending through said member and said member forming an upper and lower compartment in said structure.

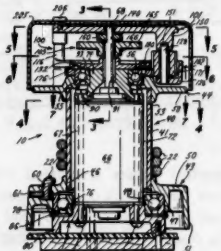
4,084,793

WINCH WITH AUTOMATIC CLUTCH ASSEMBLY

William P. Gardiner, White Bear Lake, Minn., assignor to Byrd Industries, Inc., Memphis, Tenn.

Filed May 19, 1976, Ser. No. 688,015
Int. Cl.² B66D *1/00*
U.S. Cl. 254—187.8 **20 Claims**

1. A winch and clutch assembly comprising a spool about which a line is to be wound and unwound, a motor having a housing and a drive shaft, a frame associated with the housing, an annular driven member associated with said spool such that rotation of said driven member imparts rotation to said spool, drive means connecting said motor shaft to said annular driven member to drive said annular driven member, said drive means including an annular driving member, said driven member and said driving member having concentric, adjacent surfaces, at least one first recess in said concentric surface of said driving member and at least one second recess in said concentric surface of said driven member, an annular bearing, a pivot member associated with said bearing the pivot member movably attached to the frame during operation and the entire pivot member operably movable to urge said bearing into said first and second recesses to drivingly engage said driving member to said driven member in response to the relative movement between said driving member and said driven member in a first direction, and to urge said bearing out of such engagement in response to relative movement between said driven member and said driving member in a direction opposite the first direction.

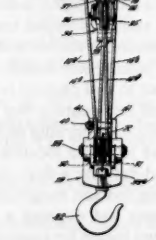


4,084,794

HOIST OR WINCH MECHANISM ADAPTED FOR MULTIPLE VARIABLE RIGGING

Bernard E. Wallace, Exton, Pa., assignor to B. E. Wallace Products Corporation, Malvern, Pa.

Filed Jul. 9, 1976, Ser. No. 703,830
Int. Cl.² B66D *3/08*
U.S. Cl. 254—189 **1 Claim**



1. In winch-hoist apparatus, a generally box-shaped winch frame having a top cross member, for securement to fixed structure, and a pair of arms extending from said cross member

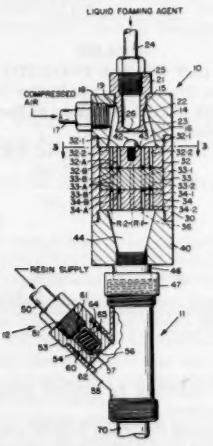
in spaced, general, parallelism toward a load, a drum mounted for rotation between said arms in an intermediate region of the length thereof, a cable having one portion secured to said drum, a spaced portion secured to said winch frame, and a looped, intermediate portion, means for rotating said drum to provide for reeling and unreeling of said cable from said drum, and load-carrying means carried in the cable loop and providing for use of the apparatus, selectively, under either a doubled rigging condition, or a rigging condition which is a multiple of such doubled rigging, said load-carrying means comprising: a first generally U-shaped pulley block assembly having hook means carried by the U, and at least first and second pulleys rotatably mounted between the arms of the U, which arms terminate in spaced, generally parallel, portions extending toward said winch frame; a second pulley block assembly, movably disposed in the cable rigging intermediate said winch frame and said first assembly, and carrying at least one pulley, said cable passing from said drum over the first pulley of said first assembly, then over said one pulley of said second assembly, then over the second pulley of said first assembly, and thence toward and into securement to said winch frame, said second assembly carrying securement means comprising pairs of spaced arms, one of said pairs facing said first assembly and the other of said pairs facing the spaced arms of said winch frame, said one pair of arms being shaped to interleave with the arm portions of said first assembly when double rigging is desired, said other pair being shaped to interleave with said winch frame arms when multiple rigging is desired; and means for selectively and releasably maintaining said one pair interleaved with the arm portions of said first pulley assembly, and means comprising pin means for selectively and releasably maintaining said other pair interleaved with the arms of said winch frame; and said apparatus further including adjustable means for guiding the cable with respect to said drum, during reeling and unreeling of the cable, said pin means including a portion which cooperates in providing adjustably pivotal securement of said guide means to said winch frame, under both the double and the multiple rigging conditions, the said guide means being Pivotally mounted on said pin means and located between the frame and said second assembly.

4,084,795

APPARATUS FOR MANUFACTURING FOAMED PLASTICS

Daniel J. Vaughn, 73 Wildbriar Rd., Rochester, N.Y. 14623

Filed Sep. 22, 1975, Ser. No. 615,768
Int. Cl.² B01F *3/04*
U.S. Cl. 366—177 **8 Claims**



1. Apparatus for producing a cellular, foamed plastic from a mixture of synthetic resin and a liquid foaming agent, comprising

means defining a pair of spaced chambers,

a plurality of perforated plates extending transversely across one of said chambers intermediate the ends thereof,

means for supplying a liquid foaming agent to one end of said one chamber for passage through said plates to the opposite end of said one chamber, and to be converted during passage through said plates into a foam having a predetermined bubble structure,

means connecting said chambers to convey foamed liquid from said one to the other of said chambers,

means for feeding a synthetic resin to said other chamber for mixture therein with the foamed liquid from said one chamber, and

means for dispensing the mixture of resin and foamed liquid from said other chamber,

each of said plates having therethrough a plurality of spaced, parallel openings that are angularly offset from the openings in the adjacent plate, and

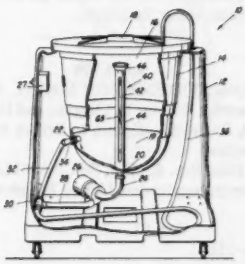
the confronting surfaces of said plates having therein grooves, which connect the openings in each plate with the offset openings in the adjacent plate, whereby the interconnected, offset openings in said plates define a plurality of spaced conduits through which the liquid foaming agent passes from said one end of said one chamber to the opposite end thereof.

4,084,796

LIQUID MIXING DEVICE

Vivian D. Krehbiel, Wichita, Kans., assignor to Kreonite Inc., Wichita, Kans.

Filed Nov. 22, 1976, Ser. No. 744,181
Int. Cl.² B01F *5/12*
U.S. Cl. 366—137 **4 Claims**



1. A liquid mixing device, the device comprising:

a frame;

a liquid tank mounted on said frame for receiving different types of liquids to be mixed therein;

a circulating and mixing pump mounted on the frame, said pump connected to an intake port and a discharge port in said tank, said pump receiving unmixed liquids through said intake port, mixing said liquids therein and circulating the mixed liquids through the discharge port;

a vertical inner tube mounted on the top of said intake port, said inner tube having apertures in the lower portion thereof for receiving a liquid therethrough from the lower portion of said tank, said inner tube further including an elongated spiral slot therethrough and disposed around the circumference of said inner tube and along the length thereof a radially extending flange at the lower portion of said inner tube between the apertures and the slot; and

a vertical outer tube disposed around said inner tube and resting on said flange, said outer tube having an elongated slot parallel to the length of said outer tube and therethrough, by indexing the elongated slot of said outer tube with the elongated spiral slot of said inner tube an elongated aperture is formed through said tubes which can be

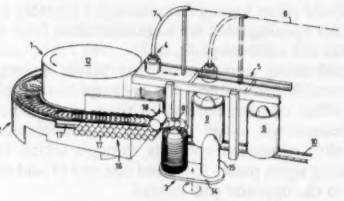
adjusted along the depth of the liquids in said tank for receiving an unmixed liquid at a particular depth therethrough and thereby mix the liquid from said particular depth and the liquid received through the apertures in said inner tube.

4,084,797

DEVICE INTENDED FOR CONTROLLED COOLING OR WIRE, ESPECIALLY STEEL WIRE

Walter Johann Karlberger, Smedjebacken, Sweden, assignor to Morgardshammar Aktiebolag, Smedjebacken, Sweden

Filed Feb. 28, 1977, Ser. No. 772,959
Claims priority, application Sweden, Mar. 15, 1976, 7603274
Int. Cl.[2] C21D *9/56*
U.S. Cl. 266—106 **7 Claims**



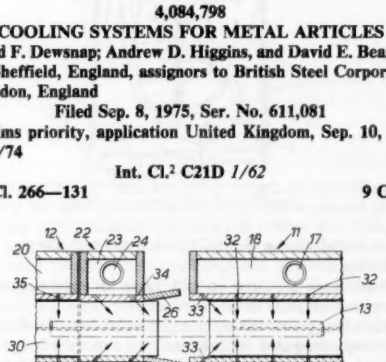
1. Device intended for controlled cooling of wire, especially steel wire, characterized in that said device, in combination, comprises a movable conveyor (1) to which wire (6) is continuously supplied in open ring windings (8) for movement of the same in mutually displaced positions, means (2) surrounding the conveyor for control of the temperature ratios of the wire and a collection device (3) for the cooled ring windings, said conveyor (1) essentially having the shape of an inclined plane (11) which rotates about its center.

4,084,798

COOLING SYSTEMS FOR METAL ARTICLES

Ronald F. Dewsnap; Andrew D. Higgins, and David E. Beard, all of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Sep. 8, 1975, Ser. No. 611,081
Claims priority, application United Kingdom, Sep. 10, 1974, 39446/74
Int. Cl.[2] C21D *1/62*
U.S. Cl. 266—131 **9 Claims**



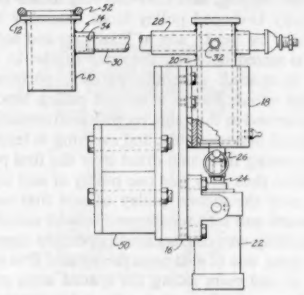
1. A cooling system for cooling hotrolled rod, billet or bar, said cooling system including a substantially horizontal trough open at its ends to permit entry and exit of the bar, a first set of inlets positioned along at least one side of the trough to direct water under pressure into the trough, said first set of inlets being in the form of vertical slots which direct a flow of water perpendicular to the direction of movement of the bar, and a second set of inlets situated adjacent at least one end of the trough, said second set of inlets being in the form of vertical slots and positioned so as to direct fluid into the trough so that in use they act to retain water in the trough and to control the flow of water from the trough.

4,084,799

SHROUDING APPARATUS

Michael D. Coward, Georgetown; William J. Dobinski, Myrtle Beach, and Rocose M. Hinson, Jr., Pawleys Island, all of S.C., assignors to Georgetown Steel Corporation, Georgetown, S.C.

Filed Aug. 30, 1976, Ser. No. 718,705
Int. Cl.[2] B22D *11/10, 35/04*
U.S. Cl. 266—207 **13 Claims**



1. A shrouding apparatus for protecting the liquid stream issuing from the bottom of a tundish comprising:

(a) a shroud tube having a vertically oriented longitudinal axis;

(b) means connected to said shroud tube for aligning the axis of said shroud tube with said liquid stream, said means comprising;

(1) a base,

(2) a pivot means housing connected to said base,

(3) pivot means housed in said pivot means housing,

(4) a shroud tube support arm sleeve carried by said pivot means,

(5) a shroud tube support arm longitudinally movable in said shroud tube support arm sleeve, and

(6) retaining means carried by said sleeve and engageable with said support arm for maintaining said support arm in proper orientation;

(c) means connected to said shroud tube for raising and lowering said tube into and out of contact with said tundish;

(d) sealing means between said shroud tube and said tundish capable of creating a substantially gas tight seal; and

(e) means communicating with said shroud tube for introducing gas to the interior of said shroud tube.

4,084,800

THERMALLY STABLE INJECTOR LANCE

Douglas Earl Butts, Brook Park, and Walter Neil Rossborough, Rocky River, both of Ohio, assignors to Rossborough Supply Company, Cleveland, Ohio

Filed Feb. 17, 1976, Ser. No. 658,272
Int. Cl.[2] C21C *7/00*
U.S. Cl. 266—225 **10 Claims**

1. A lance for injecting particulate material into molten metal which comprises:

an elongated thermal insulating member having spaced apart first and second ends and at least one wall therebetween defining the member;

a reinforcing rod axially disposed in the insulating member,

said rod having a plurality of outwardly extending protrusions in contact with said insulating member;

a length of wire wound around the reinforcing rod in a spaced apart relationship and affixed to at least one of said protrusions with said wire being in contact with the insulating member;

and a hollow injection tube having spaced apart first and second ends axially disposed in the insulating member.

4,084,801

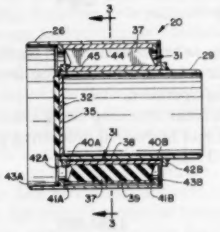
SHOCK ENERGY ABSORBING MULTI-SEGMENT LOAD CELL

Don B. Landers, and Robert K. Brock, both of Arlington, Tex., assignors to Oil States Rubber Company, Arlington, Tex.

Filed Nov. 28, 1975, Ser. No. 636,159

Int. Cl.[2] F16F *7/12;* **B63B** *59/02;* **E02B** *3/22*

U.S. Cl. 267—140 **16 Claims**



1. In an energy absorbing load cell: first and second relatively movable telescoping members; with said first telescoping member being larger than, and enclosing, a substantial portion of said second telescoping member; said second telescoping member being of smaller size through the longitudinal portion thereof telescoped within said first telescoping member with spacing between said first and second telescoping members; said structural means being comprised exclusively of shear load travel distortable load absorbing segments having a block of elastomeric flexible material with first and second spaced surfaces thereof bonded respectively to an individually associated pair of first and second plates of relatively rigid material and with respective ones of each said associated pair of plates being individually rigidly affixed to each of said first and second telescoping members; and said structural means including at least a first plurality of longitudinally extending shear load travel distortable load-absorbing segments symmetrically positioned with mutually parallel longitudinal axes in the spacing between said first and second telescoping members and extending substantially over the longitudinal extent of said spacing.

4,084,802

PICTURE FRAME VISE

Harold Lee Cannon, 314 W. University Dr., Chapel Hill, N.C. 27514

Filed Jul. 7, 1977, Ser. No. 813,630

Int. Cl.[2] B25B *1/20*

U.S. Cl. 269—41 **1 Claim**

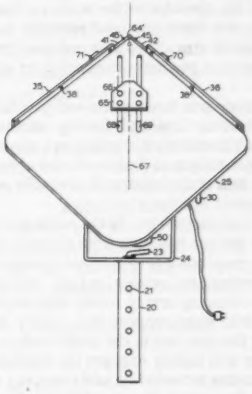
1. A mitered corner joining clamp device for simultaneously applying pressure to a pair of mitered picture frame members, comprising:

(a) a vise worktable having secured thereto at a selected joining point corner backing means provided adjustable upstanding wall surfaces positioned at a predetermined included angle therebetween, said vise worktable further including an elongated slot configuration oriented parallel to a line bisecting said angle;

(b) an adjustable wedge member slidably positioned on the outer side of said vise worktable for travel along said slot configuration and having leading edge surfaces for applying a corner pressure against a pair of mitered picture frame members interposed against said surfaces, said wedge member including adjustable pointed means on the leading edge surfaces thereof adapted to engage said picture frame members;

(c) reversible drive means mounted on the underside of said vise worktable and including a reversible electric drive motor, a screw member driven thereby and a screw block traveling thereon secured through said slot configuration to said wedge member;

(d) respective forward and reverse control means mounted on said vise worktable for energizing said drive motor selectively in forward and reverse modes of operation thereby enabling said screw block to cause said wedge member to be selectively driven toward said surfaces for clamping said pair of mitered picture frame members or away from said surfaces to release said pair of mitered picture frame members after being joined, said control means including a pair of finger tip electric control buttons and circuit means associated therewith, one of said finger tip control buttons being mounted on one side of said vise worktable proximate said joining point corner at which said pair of mitered picture frame members are



intended to be joined and the other switch member being mounted at an opposite position of said vise worktable with both of said switch members being accessible for finger tip button control;

(e) additional switch means mounted on the underside of said vise worktable and arranged to be engaged by said screw block during rearward travel thereof to deenergize said drive motor and thereby limit the rearward motion of said gear block member and cushioned coupling means coupling said screw member to said drive member adapting said wedge to provide a cushioned clamping effect; and

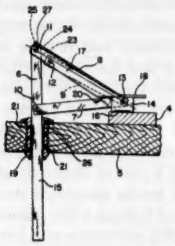
(f) post and bracket support means secured to the underside of said vise worktable, said post and bracket support means including a bracket pivotably secured to said underside and mounting first clamp means for adjustably positioning said vise worktable around a horizontal axis beneath said vise worktable and perpendicular to the line bisecting said angle, said post and bracket support means further including a vertical post pivotally mounting said bracket and mounting second clamp means for adjustably positioning said vise worktable about a vertical axis extending through said post means and perpendicular to said horizontal axis.

4,084,803

CLAMP AND CLAMPING ARRANGEMENT FOR HOLDING A WORKPIECE

Gerald Beekenkamp, Etobicoke, Canada, assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 12, 1976, Ser. No. 713,644
Int. Cl.² B23Q 3/02
U.S. Cl. 269—91 **20 Claims**



1. A clamp for holding a workpiece to a work surface having an aperture formed therein comprising:

a main support arm having an end portion adapted for insertion into the aperture in the work surface;

a clamping arm having an end pivotally connected to said main support arm above said end portion;

a first lever arm pivotally connected to said main support arm;

a second lever arm having one end pivotally connected to said first lever arm and having another end pivotally connected to said clamping arm at a pivot location on said clamping arm spaced from said end of said clamping arm whereat said clamping arm is pivotally connected to said main support arm;

means for applying a force to the pivot mutually connecting said first and second lever arms to cause said lever arms to transmit respective forces to said main support arm and said clamping arm causing, in turn, said main support arm and said clamping arm to rotate with respect to each other so that said main support arm tightly engages the wall defining the aperture in the work surface and so that said clamping arm tightly engages the workpiece; and,

clamping means mounted on said clamping arm at said pivot location for engaging a workpiece placed on the work surface whereby the forces transmitted along said second lever and said clamping arm act directly at said clamping means when the workpiece is tightly engaged by the clamp.

4,084,804

METHOD AND APPARATUS FOR PRODUCING WEB UNITS

James B. Fulk, P.O. Box 947, Los Gatos, Calif. 95030, assignor to James B. Fulk, Los Gatos, Calif.

Filed Nov. 8, 1976, Ser. No. 740,034
Int. Cl.² B65H 45/00
U.S. Cl. 270—52.5 **4 Claims**

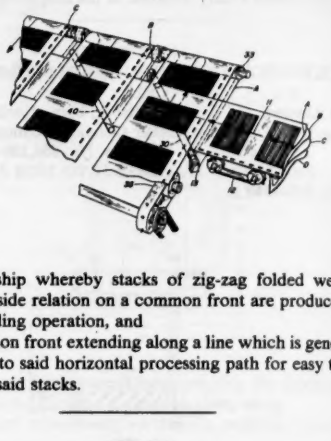
1. A method of producing a plurality of processed paper web units of business forms in a continuous operation from a plurality of supply rolls of unprocessed paper webs comprising,

advancing the webs from the respective supply rolls along a generally horizontal processing path wherein said webs are simultaneously and continuously processed,

performing a first processing step simultaneously on all of said webs while they are in superposed relation and are moving continuously along said path,

separating the processed webs while they are continuously moving and imparting a first change at spaced points in the direction of movement of the respective webs which is substantially at a right angle to the direction of travel during the first processing step, whereby the webs are then moving in side-by-side spaced relationship in substantially a common plane but at substantially a right angle to said path,

performing a zig-zag folding operation on said webs while they are continuously moving in said side-by-side spaced



relationship whereby stacks of zig-zag folded webs in side-by-side relation on a common front are produced by said folding operation, and

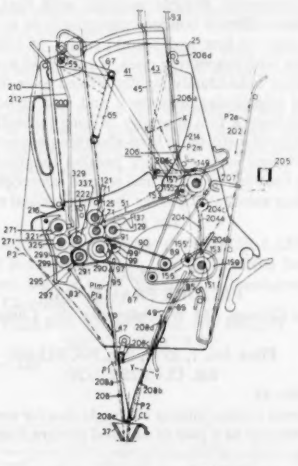
said common front extending along a line which is generally parallel to said horizontal processing path for easy takeaway of said stacks.

4,084,805

SHEET HANDLING DEVICE PARTICULARLY USEFUL AS LEDGER FEEDER AND STACKER FOR ACCOUNTING MACHINES

Adam Simpson, Uddington, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 18, 1976, Ser. No. 732,841
Claims priority, application United Kingdom, Nov. 6, 1975, 45988/75
Int. Cl.² B65H 1/28, 29/60, 29/44
U.S. Cl. 271—4 **11 Claims**



3. A sheet handling device for handling sheets to be processed by a data processing machine, comprising: a right and left side frame member: a main hopper compartment disposed between said frame members for receiving sheets to be processed; a main stacker compartment disposed between said frame members for receiving sheets after their processing; sheet feeding means for feeding the sheets from the main hopper compartment through a first path leading to the data processing machine; sheet stacking means for moving the

sheets, after their processing by the data processing machine, through a second path leading from the data processing machine to the stacker compartment; a stacker ram pivotally mounted to said frame members in the main stacker compartment; and ram drive means for moving the stacker ram away from the stack of sheets in the main stacker compartment during the operation of the stacking means, and against said stack to compact same during the operation of the sheet feeding means.

10. A sheet handling device for handling sheets to be processed by a data processing machine, comprising: a right and left side frame member; a main hopper compartment disposed between said frame members for receiving sheets to be processed; a main stacker compartment disposed between said frame members for receiving sheets after their processing; sheet feeding means for feeding sheets from the main hopper compartment through a first path leading to the data processing machine; sheet stacking means for moving the sheets after their processing by the data processing machine, through a second path leading from the data processing machine to the stacker compartment; said second path including a hold station disposed between said frame members for temporarily holding processed sheets being fed from the data processing machine; a substantially V-shaped pivotably mounted hold station deflector in said second path said deflector being pivotably actuated by a sheet moving into the hold station wherein said sheet engages one surface of said V-shaped deflector causing said deflector to pivot into a blocking position to prevent another sheet leaving the data processing machine from passing into said second path; and control means for selectively controlling said sheet stacking means to terminate the operation thereof when the process card has reached the hold station.

4,084,806

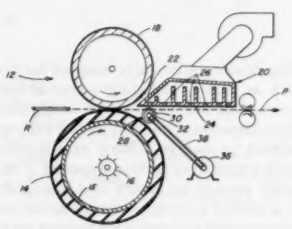
SHEET HANDLING APPARATUS

Stephen James Wenthe, Rochester, and David Arlen Caswell, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,526

Int. Cl.[2] B65H *29/20*

U.S. Cl. 271—80 **3 Claims**



1. In a sheet handling apparatus having means for transporting sheets at a given velocity along a sheet travel path, guide means for moving sheets diverging from said travel path back into said travel path, said guide means comprising:

shaft means located adjacent to said travel path, a helical spring defining a first helix and mounted in a second helix about said shaft means so as to engage any sheet diverging from said travel path, said second helix of said spring being open-wound such that the outer segments of the convolutions forming said first helix are parallel to the rotational axis of said shaft means and lie in a plane including said axis, and means for rotating said shaft means in a direction and at an angular speed such that the periphery of the convolutions forming said first helix at the point closest to said travel path move in the same direction as the transported sheets and at a tangential velocity greater than said given sheet velocity, whereby any sheet engaged by the spring is moved back into said travel path.

4,084,807

PAPER FEEDING ROLLER

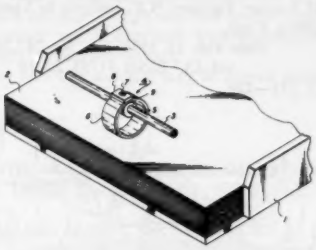
Yasuhiko Terajima, and Osamu Matsumoto, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed May 7, 1976, Ser. No. 684,203

Claims priority, application Japan, Sep. 12, 1975, 50-124930[U]

Int. Cl.[2] B65H *3/06*

U.S. Cl. 271—119 **1 Claim**



1. An apparatus for feeding substrates comprising in combination:

a rotatable shaft;

an elliptical interrupted, resilient member connected to said shaft so that it rotates with said shaft; and

wherein said elliptical interrupted resilient member is mounted eccentrically to said shaft so that as the shaft rotates said annular resilient member flattens on said substrates to feed said substrates.

4,084,808

METHOD AND APPARATUS FOR STACKING PRINTED PRODUCTS CONTINUOUSLY ARRIVING IN A SUBSTANTIALLY FISH SCALE OVERLAPPING ARRANGEMENT

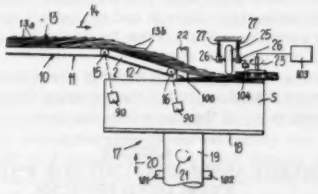
Walter Reist, Hinwil, and Werner Honegger, Ruti, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed May 16, 1975, Ser. No. 578,357

Claims priority, application Switzerland, May 28, 1974, 7234/74

Int. Cl.[2] B65H *31/04*

U.S. Cl. 271—213 **22 Claims**



1. A method of stacking printed products continuously arriving in a fish scale product stream, comprising the steps of infeeding a fish scale stream of printed products for movement along a predetermined path of travel, deflecting each incoming printed product of the fish scale product stream in its plane, and winding the incoming printed products in their plane the fish scale product stream into a spiral-shaped stack to form a plurality of successive windings of printed products, each winding having printed products partially overlapping one another, the printed products of one winding bearing against the printed products of the next subjacent winding to thereby transform said fish scale product stream into a spiral-shaped stack of printed products.

2. The method as defined in claim 1, including the step of deflecting the incoming printed products about a station momentary center which is located at the end region of a lateral edge of the fish scale product stream.

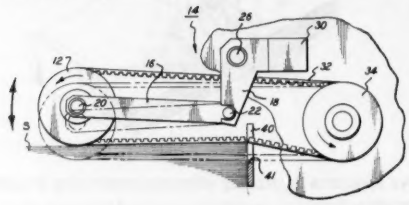
3. The method as defined in claim 1, including the step of deflecting the incoming printed products about a stationary momentary center which is located at the region of the leading edge of a not yet deflected printed product which has arrived a position for deflection.

4,084,809

SHEET STACKING APPARATUS

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 11, 1975, Ser. No. 767,705
Int. Cl.[2] B65H *31/36, 29/18*
U.S. Cl. 271—220 **2 Claims**



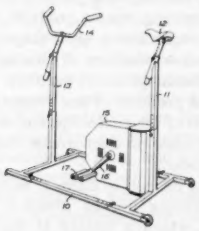
1. Sheet stacking apparatus comprising:
a frame,
stop means positioned on said frame in a sheet path to register the leading edge of incoming sheets received in a stack,
a roller member positioned to rest on the top of the stack of the incoming sheets,
said roller member being supported to float on the top of the stack and constrained to move in a generally vertical direction,
said roller member being supported by a first link member connected to the axis thereof, said first link member being pivotally supported on an axis parallel to the axis of said roller member by a second link member, said second link member being pivotally supported by said frame,
a belt member encircling said roller member and extending in a predetermined path thru a passage defined in said stop means,
said belt member having a predetermined tension thereon sufficient to exert a force at the leading edges of the topmost sheets in the stack to effect registration of the sheets without buckling thereof, said second link member including a counter weight portion for controlling the tension on said belt member, and
means for moving said belt member at a predetermined rate greater than the speed of the incoming sheets so as not to inhibit entry of the sheets into the stack.

4,084,810

ENERGY ABSORBING UNIT FOR PHYSICAL EXERCISING DEVICES

Lars Östen Forsman, Lindogatan 1, S-253 72 Helsingborg, Sweden

Filed Jul. 26, 1974, Ser. No. 491,975
Claims priority, application Sweden, Aug. 2, 1973, 7310639
Int. Cl.[2] A63B *69/16, 21/24*
U.S. Cl. 272—73 **9 Claims**



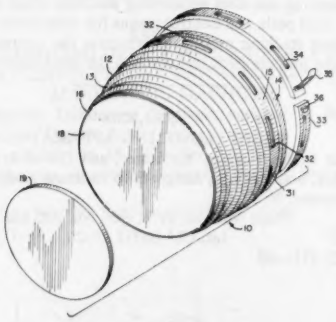
1. An energy absorbing unit for physical exercising devices comprising a frame; a member movably journalled therein comprising a rotor of a ferromagnetic material and having a circular circumference, and an input shaft and an epicyclic gearing arranged inside the rotor circumference operatively connecting the input shaft to the rotor, and having planet wheels, and at least an annular portion of the rotor being made of an electrically insulating material; which member is adapted to be driven by the training person; and said rotor being the rotor of an asynchronous AC motor having a wire-wound stator in operative relationship to said rotor which is connectable to an AC supply for generating when energized an electromagnetic motive force on the rotor to tend to drive it in the direction opposing movement of the shaft by the training person and thereby act as a braking force on the shaft independent of the movement thereof, the stator comprising a laminated metal sheet core which extends over part of the circular circumference of the rotor, partially surrounds the rotor, and has pole members facing the rotor; and wire winding provided on said pole members.

4,084,811

HITTING DEVICE FOR MARTIAL ARTS

Han Cha Kyo, 7551 N. Bell, Chicago, Ill. 60645

Continuation-in-part of Ser. No. 552,442, Feb. 24, 1975, which is a continuation of Ser. No. 520,976, Nov. 5, 1974, abandoned.
This application Jun. 7, 1976, Ser. No. 693,630
Int. Cl.[2] A63B *69/00*
U.S. Cl. 272—76 **18 Claims**



1. A hitting device particularly adapted for practicing martial arts, such as karate, including a central bellows portion which is contractible in response to an axially directed force, a hitting portion disposed at one end of said bellows portion and having a surface to receive a blow exerting such an axially directed force, a mounting portion disposed at an opposite end of said bellows portion by which said hitting device may be mounted on a desired support, and vent means associated with said hitting device and adjustable for venting air in a controlled manner from an interior of said hitting device during contraction of said bellows portion, said vent means including a plurality of openings formed in said hitting device to communicate said interior of said hitting device with the atmosphere, and closure means for use in association with said openings to control the rate at which air from said interior of said hitting device is vented through said openings to said atmosphere to thereby determine the contractibility of said bellows portion in respose to said axial force.

4,084,812

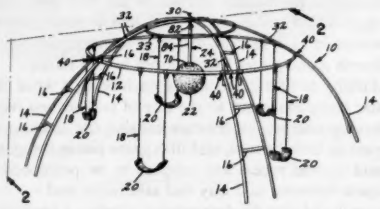
PLAYGROUND SWING APPARATUS

Kendrick B. Melrose, Edina; Gerald E. Kimmel, Minnetonka, and William F. McCombs, Edina, all of Minn., assignors to Game Time, Inc., Litchfield, Mich.

Filed Oct. 31, 1975, Ser. No. 627,755
Int. Cl.[2] A63G *9/00*
U.S. Cl. 272—85 **16 Claims**

1. Recreational apparatus comprising:
(a) a closed ring tubular member;

(b) support means including a plurality of spaced apart legs for supporting said closed ring tubular member generally horizontally above a ground surface;
(c) a plurality of seats spaced apart from one another and suspended from said tubular member by means of first elongated tension members;
(d) target support means extending across said closed ring tubular member;
(e) a spherical target object; and



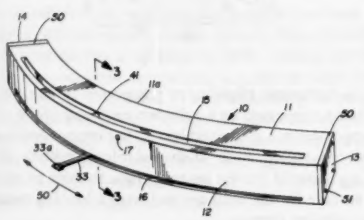
(f) a second elongated tension member connected between said object and said target support means and pendulously suspending said object from said target support means; and
(g) the dimensions of said tension members, target object, and target support means being so related that players swinging to and fro on said seats may contact said target object with their feet.

4,084,813

TOE BOARD AND MEASURING MEANS

Robert S. Washnock, 395 Brown St., Akron, Ohio 44308, and Delbert R. Madzay, 357 W. Turkeyfoot Lk. Rd., Akron, Ohio 44319

Filed Sep. 16, 1976, Ser. No. 724,024
Int. Cl.[2] A63B *65/04*
U.S. Cl. 272—106 **4 Claims**



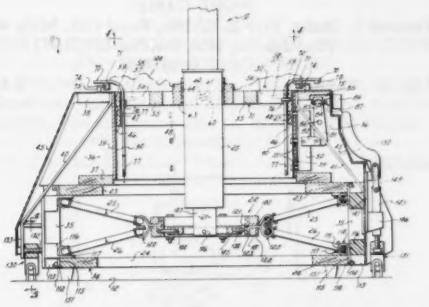
1. An athletic toe board assembly comprising
(A) an elongate restraining board of generally rectangular cross sectional configuration and arcuate planar configuration having
(1) a top surface;
(2) a convex front surface; and
(3) an elongate arcuate internal track extending at least partially along its longitudinal axis;
(B) said top surface having a first arcuate elongate access opening therein
(1) extending along the longitudinal axis thereof and
(2) communicating with said track;
(C) said front surface having a first elongate access opening therein
(1) extending along the longitudinal axis thereof and
(2) communicating with said track; and
(D) a spool-like tape measure
(1) disposed within said track for movement therealong,
(2) said spool-like tape measure including a spool and a measuring tape wound around said spool
(3) said spool being accessible from said top surface of said board through said elongate access opening thereof and
(4) one end of said tape being extendable through said elongate access opening of said front surface;
(E) elongate operating handle means received in said first access opening in said top surface one end of which is connected to said spool-like tape measure and the other end of which extends through said first access opening in said top surface and is provided with grasping means disposed only on said top surface
(1) whereby said tape measure may be moved along said track.

4,084,814

GYMNASTIC POLE AND MOUNT THEREFOR

Robert Boggild, Graham Home Place Rd., S. Pittsburg, Tenn. 37380

Filed Oct. 12, 1976, Ser. No. 731,579
Int. Cl.[2] A63B *9/00*
U.S. Cl. 272—110 **15 Claims**



1. In a gymnastic amusement device, a mount for receiving a fiber glass pole comprising,
a frame for supporting a fiber glass pole,
a pole socket means having an upwardly projecting free end and disposed centrally within said frame,
resilient means positioned at the free end portion of the socket means and adapted for supporting the socket means,
means supporting the upper end of said socket means, said supporting means being vertically adjustable with respect to said socket means, said supporting means comprising,
pole regidity adjustable ring means encircling the socket means, said ring means having external threads with at least one stud mounted on said frame projecting into said threads so that rotation of said ring means with respect to said studs effects the raising and lowering of said ring means,
and means connecting said ring means to said socket means.

4,084,815

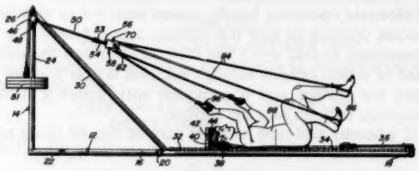
CONTINUOUS TENSION EXERCISER

Matt W. Flannery, 310 Berry Ave., Westwood, Ashland, Ky. 40010

Filed Jul. 14, 1976, Ser. No. 705,132
Int. Cl.[2] A63B *21/06*
U.S. Cl. 272—119 **23 Claims**

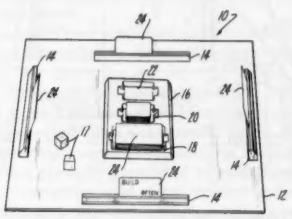
22. In combination with an elevated support structure, first pulley means supported from said support structure, first elongated flexible tension member means guidingly engaged over said pulley means for lengthwise back and forth shifting relative to said pulley means and including a depending first end portion from which a gravity weight is suspended, said weight being of constant predetermined selected value, second pulley

means anchored relative to the second end of said first tension member means, second elongated flexible tension member means guidingly engaged over said second pulley means, and body limb engageable portions carried by the opposite ends of said second elongated tension member means, said limb en-



gageable portions adapted to be engaged by arm and/or leg limbs with forces exerted by the limbs engaged therewith in opposition to the contant predetermined selected gravity weight value of said weight means suspended from said first end portion of said first tension member means.

4,084,816
WORD GAME
Deborah L. Shafer, 2110 E. Lincoln, Royal Oak, Mich. 48067
Filed Jun. 21, 1976, Ser. No. 697,725
Int. Cl.² A63B *3/00*
U.S. Cl. 273—1 R **6 Claims**



1. A game having a plurality of game pieces for use in evolving word combinations, said game comprising:

a game board;

a plurality of game piece racks strategically located about said game board to permit a participant to sit adjacent one of said racks and to position game pieces on said one rack in such a manner that written indicia on said game pieces is viewable by said participant, while said written indicia is concealed from the remaining participants and said remaining participants are adjacent the other of said plurality of racks;

a card tray carried by said game board in a location which is central to said game piece rack so as to provide a space between said racks and said tray for the positioning of selected game pieces thereon, said tray having first, second, and third laterally spaced recesses, said first recess being sized so as to be larger than said second and third recesses, said second and third recesses being substantially the same size, said third recess being adapted to store discarded game pieces;

a plurality of first game pieces, each being a word card of a size complementary to the size of said first recess and having a series of words thereon wherein each series of words has one vowel combination and different letters of the alphabet, said first card being stored in said first recess of said tray and being adapted to be selected therefrom and stored in said racks;

a plurality of second game pieces, each of said second game pieces being of a size complementary to the size of said second recess and having a letter of the alphabet thereon, said second game pieces being stored in said second recess of said tray and selected numbers of said second game pieces being positionable on said racks;

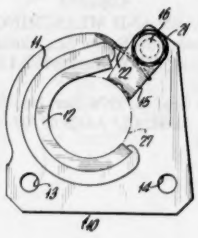
a plurality of third game pieces, each of said third game pieces being a card of a size complementary to said second recess and having in duplication certain of the words on said first game pieces, said third game pieces being stored in said second recess and a selected number thereof being adapted to be stored in said racks;

a plurality of fourth game pieces, each being a word card of a size complementary to the size of said second recess and having in duplication certain of the vowel combinations on said first game pieces, said fourth game pieces being stored in said second recess, a selected number of said fourth game pieces being stored in said racks;

a plurality of fifth game pieces, each being a word card of a size complementary to the size of said second recess and having instructions thereon causing the drawing participant to forfeit a turn, said fifth game pieces being stored in said second recess and adapted to be positioned in said space between said tray and said racks; and

a plurality of dice for determining whether a participant will retain one of the aforementioned game pieces during the course of play.

4,084,817
CUSHION BLOCKS
Thomas M. Camilleri, 277 Ave. W, Brooklyn, N.Y. 11226
Filed Apr. 26, 1976, Ser. No. 680,182
Int. Cl.² A63D *5/00*
U.S. Cl. 273—53 **19 Claims**

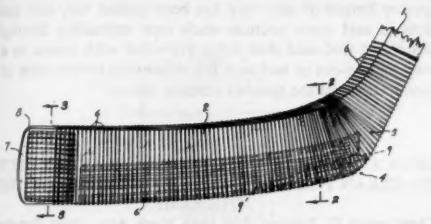


12. In an automatic pinsetter or pinspotter having a bowling ball backstop supported by a cylinder, each end of the cylinder being supported in a U-shaped block, the improvement which comprises providing each U-shaped block with a layer of cushioning material on the inner surface thereof to provide a bearing surface for the cylinder and with a locking member to lock the cylinder therein.

4,084,818
HOCKEY STICK WITH REINFORCEMENT FILAMENT WINDING
Marcel Goupil, 948 Chasse Street, and Marc Ruel, 265 Lemire Boulevard, both of Drummondville, Quebec, Canada
Filed Jan. 14, 1977, Ser. No. 759,312
Int. Cl.² A63B *59/14*
U.S. Cl. 273—67 A **4 Claims**

1. A hockey stick having a handle and a blade connected to the handle at an angle by means of a junction area, part of the handle, the junction area and at least part of the blade being covered by a spiral winding of a high tensional strength continuous yarn wound in a single layer without intersection of the yarn, the tension applied to the winding amounting to between 20% and 50% of the total tensional strength of the yarn, each coil of the yarn being inclined not more than 12° relative to the respective longitudinal axes of the handle and of the blade, the

orientation of the coils covering the junction area progressively changing from the orientation of the coils covering part



of the handle to the orientation of the coils covering at least part of the blade.

4,084,819

GOLF CLUB SHAFT FOR IRONS

Richard L. Van Auken, Somerville, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 2, 1976, Ser. No. 738,277
Int. Cl.[2] A63B *53/10*
U.S. Cl. 273—80 R **6 Claims**

1. In a golf shaft having a tubular metallic core and a graphite fiber reinforced sheath on the surface thereof, said tubular metallic core having a tip section, body section and butt section, the improvement comprising: a graphite fiber reinforced tubular resin body inserted in and adhesively bonded to the interior surface of the tip section of said tubular metal core, said tubular resin body having unidirectional continuous graphite fibers embedded therein, said graphite fibers being oriented at a predetermined angle with respect to the longitudinal axis of the tubular metal core.

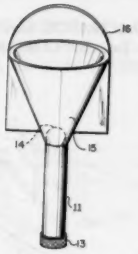
4,084,820

JET LAUNCH TOY

Knute E. Olson, Jr., 190 Plain St., Brockton, Mass. 02402

Continuation-in-part of Ser. No. 586,956, Jun. 6, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,485
Int. Cl.[2] A63B *65/12*
U.S. Cl. 273—96 R **1 Claim**

1. A jet launching toy comprising in combination,
a hollow jet launching tube having a ball shaped missile receiving end and a hand striking end to receive compressed air,
a tight ball shaped missile for inserting in one end of said tube whereby a user can strike the hand striking end with his cupped hand to launch said missile,
a rubber end ring at said hand striking end to protect the users hand,
a funnel shaped end at said missile launching end to catch returned missiles,
an end board attached to said funnel for batting back missiles,



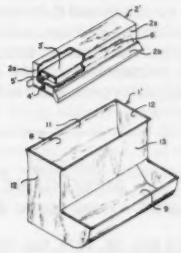
a forward leaning board to divert launched missiles, and collumnating jet ring at said launching end.

4,084,821

MAGNETIC COLLECTION DEVICE FOR BINGO CHIPS AND SIMILAR GAME PARTS

Sam S. Vidnovic, 2803 Lafayette St., McKeesport, Pa. 15132

Continuation-in-part of Ser. No. 674,485, Apr. 7, 1976, Pat. No. 4,046,383. This application Jun. 15, 1977, Ser. No. 806,752
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—148 R **2 Claims**



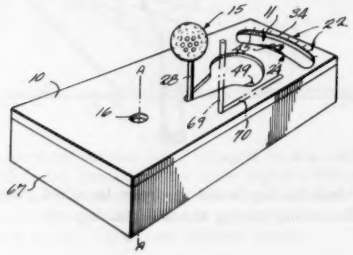
1. An apparatus for collecting game playing markers comprising:
(a) a plurality of markers of material which is attracted by a magnetic force;
(b) a magnet;
(c) a hollow non-magnetic housing adapted to receive said magnet,
(1) said housing having sufficient interior dimension to allow said magnet to be moved a significant distance away from the interior surface of the bottom of said housing; and
(2) said magnet being normally disposed against said interior surface of the bottom of said housing whereby said markers are attracted to and held against the exterior surface of the bottom of said housing;
(d) means for moving said magnet within said housing away from the interior surface of the bottom of said housing whereby said markers are released; and
(e) a container of non-magnetic material having L-shaped sides, an open top, a front wall, open trough, and contoured base and back member, said container being adapted to engage and activate said magnet moving means when said housing is inserted in said open top to move said magnet away from the interior surface of the bottom of said housing to release the markers into said container.

4,084,822

GOLF PRACTICE DEVICE

John H. Keeton, P.O. Box 278, Taylor Blvd., Campbellsville, Ky. 42718

Filed Oct. 14, 1976, Ser. No. 732,374
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—185 D **15 Claims**



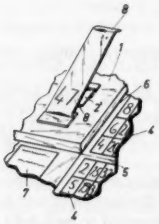
1. A golf practice device comprising
(a) a plate having a first opening formed therein,
(b) indicia cooperating with said opening and readable through said first opening,
(c) a practice golf ball rotatable with respect to said plate and adapted to be struck by a club,
(d) first means for indicating the push or pull of the practice ball when struck by a club.
(e) second means for indicating the distance of travel of the practice ball when struck by a club,
(f) third means for indicating the hook or slice of the practice ball when struck by a club, and
(g) means for mounting said first, second, and third indicating means so that all said means cooperate with said plate opening so that the distance, hook or slice, and push or pull of the practice ball may be determined merely by observing the plate opening and indicia cooperating therewith.

4,084,823

BINGO GAME

Lars Roger Häggedal, Värvadersgatan 21, Göteborg, Sweden (S-417 31)

Filed Sep. 28, 1976, Ser. No. 727,425
Claims priority, application Sweden, Oct. 1, 1975, 7510986
Int. Cl.[2] A63F *3/06*
U.S. Cl. 273—269 **5 Claims**



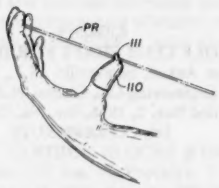
1. An improved game for playing the game of chance known as "bingo", comprising an individual playing-card section for each one of a number of players, said section having a plurality of numbers, grouped in rows and marked off by the players as the respective numbers are drawn, until according to the rules, one of the players has the particular combination, i.e. "bingo", the improvement comprising a draw section for each player in addition to said playing-card section, said draw section being provided with a plurality of flexible, encased and rolled-up tapes, a free end on each tape serving as a pulling tab for pulling said tape out, a concealed number provided on each one of said tapes, whereby said number may be read for subsequent marking-off on said playing-card section only after the greater length of said tape has been pulled out, and passage slots in said draw section, each tape extending through its associated slot, said slots being provided with means to allow easy pulling-out of said tape but to prevent re-insertion of said tape to conceal the number already drawn.

4,084,824

DEVICE TO ASSIST IN HOLDING A PLAYING RECORD TO CLEAN THE SAME AND THE METHOD OF USING THE SAME

Christopher G. Kalivas, 104 Pine Neck Ave., East Patchogue, N.Y. 11772

Filed Aug. 4, 1976, Ser. No. 711,653
Int. Cl.[2] G11B *3/58;* **B65G** *7/12*
U.S. Cl. 274—1 R **1 Claim**



1. A method of cleaning a playing record utilizing a playing record retainer which retainer comprises means constituted for securing the same to the end of the thumb, said means including means extending from an end thereof for insertion into the center hole of a playing record for retaining the record by pressure exerted by the hand of the holder between said retaining means and the remaining digits of the hand juxtaposed to said retaining means at the circumferential edge of the record, said method comprising the steps of placing the retainer on the thumb of one hand, inserting the insertion and retaining means into the center hole of a playing record and grasping the record by placing the remaining digits of the hand around the circumferential edge of the record, and exerting pressure between the remaining digits and the insertion means, then cleaning the record.

4,084,825

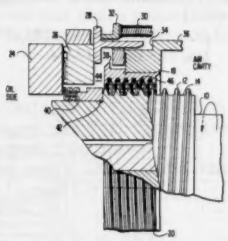
COUNTER PUMPING DEBRIS EXCLUDER AND SEPARATOR

Lawrence P. Ludwig, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 31, 1976, Ser. No. 672,222
Int. Cl.[2] F16J *15/40*
U.S. Cl. 277—25 **3 Claims**

1. In apparatus for preventing entry of debris into an engine along a rotating shaft;
a sealing comprising a non-rotating member biased into engagement with a seat rotating with said shaft;
a housing having a bore for receiving said shaft;
a first series of teeth on said rotating shaft defining a first helical-shaped grooved pattern, said first helical-shaped pattern having a pumping direction toward said seal so that rotation of said shaft pumps the pressurizing gas toward said seal while inducing a swirl motion whereby entrained debris is centrifuged outward; and
a second series of teeth in said bore spaced outward from said rotating shaft defining a second helical-shaped grooved pattern, the space between said rotating shaft and said housing defining a chamber for said seal pressurizing gas with said first and said second series of teeth forming

opposed walls of said chamber which provides the sole passage for circulation of said seal pressurizing gas to and from said seal, said second grooved pattern having a



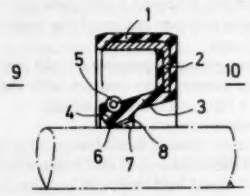
pumping direction opposite to that of said first helical-shaped grooved pattern whereby the centrifuged debris is pumped away from said seal.

4,084,826

SHAFT SEAL RING

Paul Vossieck, and Hans Deuring, both of Burscheid, Germany, assignors to GOETZEWERKE Friedrich Goetze AG, Burscheid, Germany

Filed Dec. 17, 1976, Ser. No. 751,894
Claims priority, application Germany, Dec. 18, 1975, 2556992
Int. Cl.² B61F *15/22*
U.S. Cl. 277—134 **7 Claims**



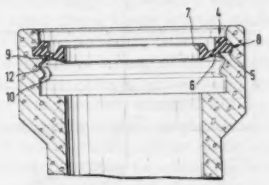
1. In a shaft seal ring having a resilient sealing lip provided with a contact face oriented at an inclined angle with respect to the seal ring axis; the contact face including a sealing edge for circumferentially engaging the surface of a shaft on which the shaft seal ring is mounted; the sealing edge determining a liquid side and an air side for the shaft seal ring; the contact face being provided with a plurality of circumferentially disposed ribs oriented at alternatingly opposite inclination with respect to the sealing edge; any adjoining, oppositely inclined two ribs constituting first and second ribs that meet at a point of intersection on the sealing edge and form first rib pairs; said first rib pairs being disposed at the air side; the improvement comprising a second rib pair provided in the area bounded by each said first rib pair; each second rib pair being formed by a third rib and fourth rib terminating on the first and second rib, respectively, of the associated first rib pair at a distance from their said point of intersection; said third rib having a reverse direction of inclination with respect to the first rib on which it terminates and said fourth rib having a reverse direction of inclination with respect to the second rib on which it terminates; the area bounded by said sealing edge and located externally of the areas bounded by each said first rib pair being rib-free and thereby reduce the total contact area of the ribs of said seal in the area bounded by the sealing edge.

4,084,827

JOINT FOR PIPES

Franz-Josef Wolf, Sprudelallee 19, D6483 Bad Soden Salmunster, Germany

Filed Jun. 28, 1976, Ser. No. 700,627
Claims priority, application Germany, Jul. 12, 1975, 2531318
Int. Cl.² F16J *15/02*
U.S. Cl. 277—168 **5 Claims**



1. A joint for pipes, particularly for pipes made of mineral materials and having high tolerances and subject to out-of-roundness, comprising:

(a) an outer sleeve for supporting a gasket ring and for receiving an inserted pipe, said sleeve having:
  (i) an annular slot for receiving a portion of a gasket ring,
  (ii) an inwardly projecting ring axially inwardly of said slot, and
  (iii) an annular chamber axially inwardly of said ring, said annular chamber being defined by a first slope which is outward and downward in the direction of insertion of a pipe and a second slope which is inward and downward in said direction and is adjacent to said first slope,

(b) a gasket comprising:
  (i) a guard ring inserted into said slot,
  (ii) a radial cross piece extending radially inwardly from said guard ring prior to insertion of a pipe and engaging said ring of said sleeve after insertion of a pipe, and
  (iii) a flange ring connected to said guard ring by said cross piece and being radially inwardly of said guard ring prior to insertion of a pipe and filling said annular chamber after insertion of a pipe, said flange ring comprising a packing washer that points in the direction of a pipe prior to insertion and in the direction of insertion after insertion of a pipe, and

(c) an inserted pipe,
  (i) said inserted pipe upon insertion into said gasket ring causing said radial cross piece to engage said ring of said sleeve, and compressing said flange ring in said annular chamber of said sleeve.

4,084,828

BELL-AND-SPIGOT CONCRETE PIPE JOINT WITH PLASTIC LINER RING

David P. Jones, Indianapolis, Ind., assignor to Construction Products Corporation, Indianapolis, Ind.

Filed Jul. 26, 1976, Ser. No. 708,591
Int. Cl.² F16L *21/02*
U.S. Cl. 277—207 A **22 Claims**

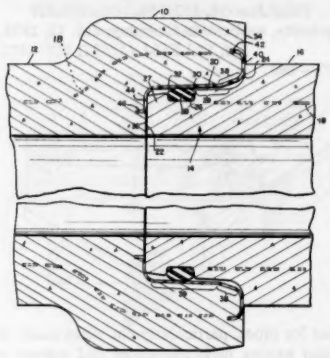
1. A concrete pipe, comprising

a tubular wall having a bell end and a spigot end, the bell end having a circumferentially continuous joint face presented radially inward and extending axially of the pipe, and the spigot end having a circumferentially continuous joint face presented radially outward and extending axially of the pipe,

said joint faces being complementary so as to form a joint between adjoining pipes in a string of such pipes with the spigot end of one received in the bell end of another and sealed with a gasket therebetween,

a liner ring of plastics material lining one of said radially-presented joint faces, said ring having a face-lining portion lying against the gasket-engaging surface thereof, a flange

portion extending radially from said face-lining portion and along a radial face of the pipe, and an edge portion extending axially from the flange portion,



the concrete of the pipe being molded against one face of the face-lining portion and the flange portion and about the edge portion so that such edge portion extends into and is buried in the molded concrete.

4,084,829

FORCE-TRANSMITTING ARRANGEMENT FOR HAMMER DRILLS

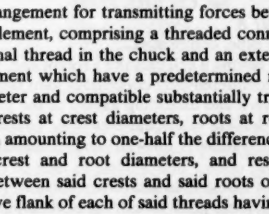
Jörg Fälchle, Bempflinge, and Reinhard Hahner, Kemnat, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 21, 1976, Ser. No. 725,191

Claims priority, application Germany, Oct. 2, 1975, 7531174[U]

Int. Cl.² B23B *31/04;* F16B *7/00*

U.S. Cl. 279—99 **9 Claims**



1. An arrangement for transmitting forces between a chuck and a tool element, comprising a threaded connection including an internal thread in the chuck and an external thread on the tool element which have a predetermined mean effective thread diameter and compatible substantially trapezoidal profiles with crests at crest diameters, roots at root diameters, heights each amounting to one-half the difference between the respective crest and root diameters, and respective flanks extending between said crests and said roots of said threads, the respective flank of each of said threads having a respective flat flank surface portion engaging the flat flank surface portion of the associated flank of the other thread when the tool element is mounted in the chuck, said flat flank surface portions of said threads being offset in the radially outward direction with respect to said mean effective thread diameter.

4,084,830

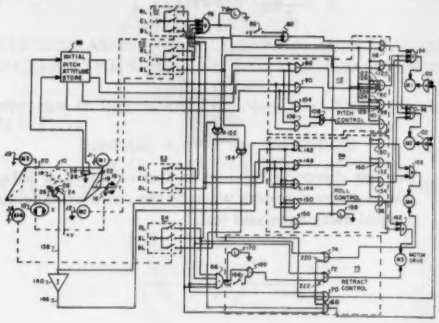
LEVELLING AND STABILIZATION SYSTEM FOR A VEHICLE

James A. Daniel, Jr., 1506 Montdale Rd., Huntsville, Ala. 35801, and John T. Hubbard, Jr., 1706 Rosalie Ridge Dr., Huntsville, Ala. 35811

Filed Apr. 4, 1977, Ser. No. 783,973

Int. Cl.² B60G *17/04*

U.S. Cl. 280—6.1 **6 Claims**



1. A levelling and stabilization system for a vehicle comprising:

a plurality of lifting jacks attached to the lower side on each side, fore and aft of the axles of said vehicle, and comprising right and left, front and rear, jacks, each of which includes a ground contacting member, and further comprises:

operating means responsive to an "extend" signal for lowering a said ground contacting member, and responsive to a "retract" signal for raising a said ground contacting member, whereby a said jack may be caused to raise or lower a corner region of the vehicle responsive to a signal, and

ground sensing means responsive to said ground contacting member coming into contact with the ground for providing a "ground contact" signal;

level sensing means comprising:

longitudinal level sensing means responsive to the downward tilt of the front end of said vehicle for providing a "front low" signal, and responsive to the downward tilt of the rear end of said vehicle for providing a "rear low" signal, and

transverse level sensing means responsive to the downward tilt of the left side of said vehicle for providing a "left low" signal, and responsive to the downward tilt of the right side of said vehicle for providing a "right low" signal; and

control means comprising:

first means responsive to an initiation signal and in circuit with and responsive to the presence, and alternately, the absence of a said ground contact signal from front jacks for providing an "extend" signal to each of the front jacks so long as there is an absence of a ground contact signal, and terminating said "extend" signal to a particular one of said front jacks upon the receipt of a ground contact signal from that jack,

second means responsive to a "front low" signal for providing said front jacks an "extend" signal, and alternately responsive to a "rear low" signal for providing a "retract" signal to said front jacks, whereby a vehicle is levelled longitudinally,

third means responsive to a "left low" signal, and alternately, a "right low" signal, and responsive to the absence of a "ground contact" signal from a jack on the low side for providing an "extend" signal to that jack until a ground contact signal is received from it,

fourth means responsive to a "left low" signal, and alter-

nately, a "right low" signal for providing an "extend" signal to the jacks on the side of the vehicle which is low, whereby said vehicle is levelled laterally, and

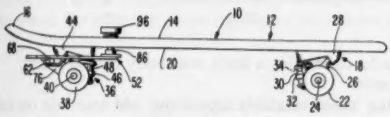
fifth means responsive to the absence of a ground contact signal from any said jack for providing an "extend" signal to that jack until a ground contact signal is provided by it, whereby said vehicle is stabilized.

4,084,831

SKATEBOARD WITH CONTROL UNIT

Ayola Ngwa Akonteh, and Y. C. Richard Kwor, both c/o P.O. Box 6628, Stanford, Calif. 94305

Filed Aug. 9, 1976, Ser. No. 713,068
Int. Cl.[2] A63C *17/14*
U.S. Cl. 280—11.2 **13 Claims**



1. A skateboard comprising: a board having an upper surface, a lower surface, and a pair of spaced wheel and axle assemblies mounted on said lower surface to permit the board to move over a support surface, one of the assemblies having a pair of wheels; an elongated frame having a pair of opposed sides; means pivotably mounting the frame adjacent to one end thereof for pivotally mounting the frame on said one assembly to permit said sides of the frame to move into and out of engagement with respective wheels of said one assembly for applying a braking force thereto as said board moves over said support surface; a shiftable actuator accessible to the foot on the upper surface of the board; means coupling the actuator to said frame near the opposite end thereof, said coupling means permitting the frame to pivot about a pair of relatively angularly disposed axes, said actuator being shiftable for moving said frame in one direction and said sides into engagement with said wheels; and means for biasing the frame in the opposite direction.

4,084,832

SHOPPING CART WITH ANTI-PILFERAGE CHARACTER

Clarence Ward Upshaw, Tuttle, Okla., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 711,856
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—33.99 S **2 Claims**

1. In an underframe for a wheeled, nestable, shopping cart that includes a goods-carrying basket supported on a generally planar basket support means that is operatively connected to but spaced above a pair of rear wheels and a pair of front casters, wherein said underframe includes a first U-shaped tubular member whose bight and adjacent portion of the legs of the U are shaped and arranged to provide the generally planar basket support means and with the portions of the legs of said first U-shaped member that are distal from the U's bight being formed to extend downwardly from said basket support means and terminating in laterally spaced upright legs positioned generally above the pair of rear wheels and to which said wheels connect; the improvement comprising, in combination:

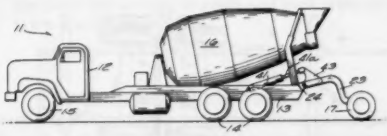
a second U-shaped member with elongated, shaped legs constructed and arranged for directly supporting and rigidifying the upper planar basket support means of said first U-member and for providing lateral and longitudinal rigidification of the lower termini of said upright legs to which the pair of rear wheels connect, said second U-shaped member being shaped, arranged and disposed so that the bight of said second U-member is spaced forwardly of and below the basket support means, the legs of said second U-shaped member extending rearwardly and diverging outwardly from the ends of the second U-member's bight, and being arranged to incline upwardly and rearwardly from said bight to a point at which said legs directly engage and secure to the upper basket support means of the first U-member adjacent a forward portion thereof, said legs then inclining downwardly and rearwardly and being secured at their termini to the downwardly extending leg portions of the first U-shaped member adjacent the lower termini of the legs of the first U-shaped member to provide both lateral and longitudinal rigidification of the downwardly extending distal leg portions of said first U-shaped member.

4,084,833

CASTERED LOAD TRANSFER AXLE STABILIZER

William J. Mohrbacker, Milwaukee, and Earl C. Thayer, Cedarburg, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 18, 1976, Ser. No. 742,823
Int. Cl.[2] B62D *61/12*
U.S. Cl. 280—81 A **7 Claims**

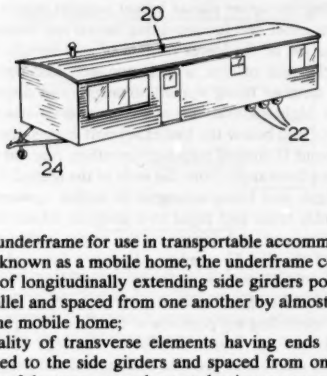


1. An auxiliary load-transfer device for connection to the rear of a truck frame comprising an axle, a castered wheel at each end of said axle and having a steering knuckle, arms pivotally connecting the axle to the truck frame, a first expansible fluid pressure operated means interposed between the truck frame and said axle and operable to provide the selected support of the rear of the truck by said wheels, a supply of fluid under pressure connected to said means and having a manually operable pressure control, a friction brake which is carried by said axle and is connected to said steering knuckles and includes a second expansible fluid pressure operated means, and fluid pressure lines connecting said first and second expansible fluid pressure operated means whereby the amount of load transferred as determined by the manual adjustment of said fluid pressure control determines also the amount of caster damping of the wheels to improve the directional stability of the truck.

4,084,834
MOBILE HOME FRAME

Willi Becker, 1315 Lake Bonavista Drive South East, Calgary, Alberta, Canada

Filed Oct. 4, 1976, Ser. No. 729,057
Claims priority, application Canada, Aug. 12, 1976, 258963
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—106 T 7 Claims

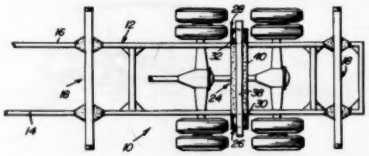


1. An underframe for use in transportable accommodation of the type known as a mobile home, the underframe comprising:
- a pair of longitudinally extending side girders positioned in parallel and spaced from one another by almost the width of the mobile home;
- a plurality of transverse elements having ends rigidly attached to the side girders and spaced from one another, each of the transverse elements having an upper extremity below those of the side girders;
- at least one shallow longitudinal member positioned between the side girders; and
- a plurality of thin plate-like elements attached to the transverse elements and to the longitudinal member to support the longitudinal member in position spaced above the transverse elements, the plate-like elements being positioned to extend longitudinally of the respective transverse elements to which they are attached.

4,084,835
FRAME SAVER FOR LOGGING TRUCKS

Clark V. Spencer, and Benjamin G. Rondeau, both of 6761 Monument Dr., Grants Pass, Oreg. 97526

Filed Jun. 24, 1976, Ser. No. 699,228
Int. Cl.[2] B62D *33/00*
U.S. Cl. 280—148 7 Claims

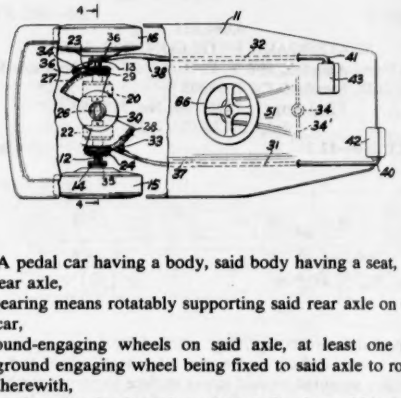


2. In a log-hauling truck including a frame, a plurality of spaced bunks arranged on the frame for supporting logs, and a wheel assembly supporting the frame from a point between the bunks, the improvement comprising false bunk means disposed over the wheel assembly for applying a positive force opposing the weight of logs being supported by the bunks and relieving flexing of the frame; and bracket means for mounting the false bunk means on the frame directly over the wheel assembly, the false bunk means including, in combination:
- (a) a pair of fluid-actuated cylinders mounted on the bracket means and each including a piston rod extending above the frame; and
- (b) a longitudinally extending false bunk mounted on the piston rods and arranged extending transverse of the frame, parallel to the bunks, for assuming part of the weight of the logs on the bunk and relieving flexing of the frame.

4,084,836
PEDAL CAR

Raymond J. Lohr, 5043 Sterrettania Rd., Erie, Pa. 16506

Filed Nov. 16, 1976, Ser. No. 742,185
Int. Cl.[2] B62M *1/04*
U.S. Cl. 280—254 12 Claims

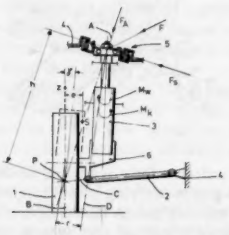


1. A pedal car having a body, said body having a seat,
a rear axle,
a bearing means rotatably supporting said rear axle on said car,
ground-engaging wheels on said axle, at least one said ground engaging wheel being fixed to said axle to rotate therewith,
a bearing plate having a boss thereon fixed to said body
a ring gear having downwardly-disposed teeth and a central opening rotatably receiving said boss,
pinions rotatably received on said axle and engaging said teeth on said ring gear,
a first one-way clutch having a first part and a second part,
and a second one-way clutch having a first part and a second part,
said first parts of said one-way clutches being fixed to said pinions,
said second parts of said one-way clutches being fixed to said axle,
two spaced forwardly-extending rods connected to said ring gear at opposite sides thereof whereby said ring gear is rotated in first direction when said first pedal rod is pushed forward rotating said axle in a first direction through said first one-way clutch, and said ring gear is rotated in a second direction when said second pedal rod is pushed in a forward direction rotating said axle in a second direction through said second one-way clutch.

4,084,837
WHEEL SUSPENSION FOR MOTOR VEHICLES

Peter James Milner, Rugby, England, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Jul. 3, 1975, Ser. No. 593,178
Claims priority, application Germany, Jul. 12, 1974, 2433583
Int. Cl.[2] B62D *17/00*
U.S. Cl. 280—668 5 Claims



1. In a suspension for a steerable wheel of a motor vehicle having a chassis, wherein the suspension includes a wheel

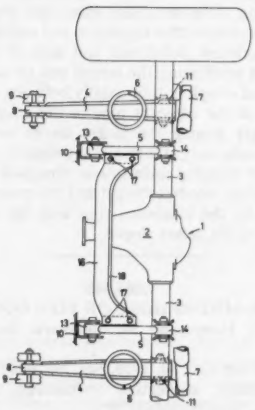
guiding shock absorber having a lower end and an upper end; a wheel carrier rigidly attached to the lower end of the shock absorber; a control arm coupling the wheel carrier to the chassis; and an upper support including a rubber spring unit resiliently connecting the upper end of the shock absorber to the chassis, the improvement wherein said rubber spring unit is constituted by a rubber ring formed of a rubber wall having a thickness less than its height; said wall having upwardly and downwardly oriented end faces; said chassis being in engagement with said rubber ring exclusively at said upwardly oriented end face and said shock absorber being in engagement with said rubber ring exclusively at said downwardly oriented end face for exposing said rubber ring at least approximately exclusively to compression effected by the force generated by the load on the wheel and to be exposed exclusively to shear by lateral forces; said rubber ring yielding more to said lateral forces than to the compression forces generated by the load on the wheel for effecting a low rigidity of the camber angle.

4,084,838

MOTOR VEHICLE REAR AXLE SUSPENSION

Rolf vor der Bruck, Cologne-Porz, and Walter Voll, Odenthal-Voiswinkel, both of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed May 24, 1976, Ser. No. 689,439
Int. Cl.[2] B60G *11/18*
U.S. Cl. 280—715 **11 Claims**



1. A motor vehicle suspension including a wheel support member constructed to rotatably support a road wheel, a vehicle frame and suspension means interconnecting said wheel support member and said frame;

said suspension means comprising a pair of suspension arms pivotally connected to said frame and to said wheel support member;

a coupling element extending between said pair of suspension arms and having its ends non-rotatably secured to said arms;

said coupling element being spaced apart from said frame and from said wheel support member;

said coupling element being rigid with respect to deflection in a horizontal plane;

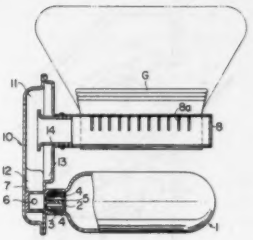
said coupling element being constructed to resiliently resist torsional deflection.

4,084,839

GAS BAG PROTECTION APPARATUS FOR VEHICLES

Shigeru Takagi, Okazaki, and Yoshiyuki Hattori, Nishio, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 12, 1976, Ser. No. 704,557
Claims priority, application Japan, Jul. 14, 1975, 50-86563
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—736 **16 Claims**



1. A gas bag protection apparatus comprising:

i. A gas bag having a normally deflated condition, said gas bag being inflated operatively upon an emergency;

ii. a diffuser communicated with said gas bag, for feeding high pressure gas into said gas bag;

iii. a gas supply source located in juxtaposed relationship with said diffuser for supplying high pressure gas into said gas bag through said diffuser, for inflating said gas bag;

iv. a residue separating chamber of substantially cylindrical configuration having a slightly conical wall for separating, from the high pressure gas, such residues as produced when the high pressure gas is released and as carried by said high pressure gas, under the influence of the centrifugal forces induced in the gas flow containing said residues;

v. a straight discharge passage connected between said gas supply source and said residue separating chamber for guiding said high pressure gas flow discharged from said gas supply source into said residue separating chamber in the direction tangential to said residue separating chamber, thereby to cause said high pressure gas flow to circulate along the inner periphery of the slightly conical wall of said residue separating chamber; and

vi. a conduit having an inlet end projecting into said residue separating chamber substantially at the center portion of the latter and serving to guide said high pressure gas flow toward said diffuser.

4,084,840

VEHICLE SENSITIVE RETRACTOR

Ernest Dorchester Buff, Bernardsville, and Jonathan Plaut, Summit, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Feb. 23, 1976, Ser. No. 660,593
Int. Cl.[2] A62B *35/02*; B60R *21/10*
U.S. Cl. 280—744 **14 Claims**

1. A safety belt retractor, comprising:

a. support means;

b. reel means rotatably mounted on said support means;

c. belt means attached to said reel means for protraction and retraction with respect thereto;

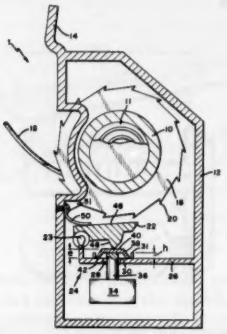
d. biasing means for urging said reel means in a retracting direction;

e. ratchet means mounted in connection to said reel means for rotation therewith;

f. pawl means mounted on said support means for engaging said ratchet means to stop rotation of said reel means and thereby prevent further protraction of said belt means; and

g. actuating means responsive to acceleration of said vehicle and including (1) mounting means comprising a substan-

tially horizontal arm having an aperture therein, (2) pendulum means comprising a pendulum weight on the lower end of a shaft connected at its upper end to a cap having its upper surface contacting said pawl means and its lower surface supported on its outer edge by said arm and (3) stop means positioned on said arm about said outer edge



for preventing horizontal displacement of said cap, said pendulum means being freely suspended from said mounting means and being displaceable by inertia from a normally substantially vertical position, such displacement operating to move said pawl means into engagement with said ratchet means.

4,084,841

AUTOMATIC SEAT BELT APPLYING DEVICE

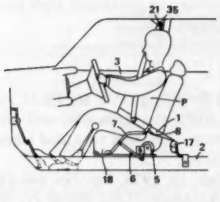
Toshiaki Hayashi, Kasugai; Hiroshi Sugiura; Toshio Ozaki, both of Toyota; Eiji Sugimoto, Toyota, and Yukio Banno, Toyohashi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 7, 1972, Ser. No. 224,079

Claims priority, application Japan, Feb. 11, 1971, 46/5842[U]; Apr. 1, 1971, 46/23729[U]; Apr. 1, 1971, 46/19887; Apr. 1, 1971, 46/19888; Apr. 1, 1971, 46/19889

Int. Cl.² B60R *21/10*

U.S. Cl. 280—745 **7 Claims**



1. An automatic seat belt applying device for a vehicle comprising: seat belt means adapted to confine an occupant of a seat to a back rest thereof; a spring-loaded retractor secured to a lower inboard portion of a vehicle body; at least one supporter mounted on the outer marginal portion of a door which is hingedly supported at its inner marginal portion by said vehicle body; said seat belt means being connected at one end thereof to said retractor to be wound thereon by the resilience of said spring and rotatably at another end thereof to said supporter; and guide means connected to a portion of said vehicle body inboard of and separated from the door for loosely supporting an intermediate portion of said seat belt means, said guide means being adapted to move away and toward said seat in response to opening and closing of said door.

4,084,842

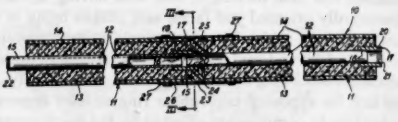
CONDUIT SYSTEM WITH EXPANSION COUPLING

Lawrence Stonitsch, 2564 Crystal Dr., Joliet, Ill. 40435, and Richard W. Stonitsch, Rte. 1, Mound Rd., Joliet, Ill. 60436

Filed Jul. 12, 1976, Ser. No. 704,332

Int. Cl.² F16L *11/12*

U.S. Cl. 285—47 **17 Claims**



1. A conduit system comprising a plurality of insulated conduit units joined end-to-end in sealed and insulated expansible and contractible relation, each unit having an internal length of pipe, an external tubular jacket, and a mass of insulation between the pipe and jacket, each pipe having a male end projecting beyond the jacket and insulation and a female opposite end, said female end having a coupling tube telescoped thereover and projecting axially therefrom, a bond integrating the telescoped end of the coupling tube with the pipe in fixed sealed relation, said coupling tube projecting beyond the jacket and insulation and having an internal groove adjacent the projected end thereof, an elastometric O-ring in said groove, the male end of one unit snugly slidably fitted in the coupling tube on the female end of an adjacent unit and sealed therewith by said O-ring, a flexible insulation ring squeezed between and in contact with the insulation of adjacent units receiving the male end of one unit therethrough and embracing and contacting the projecting end of the coupling tube, a jacket sleeve embracing the insulation ring and the ends of the jackets of adjacent units, said male end of said internal length of pipe of each unit being shiftable in said insulation ring and mass of insulation to accommodate expansion and contraction without shifting said external jacket and said mass of insulation, said insulation ring positioning the termal end of said male end of the pipe in said coupling tube axially between the O-ring and the terminus of the adjacent pipe in the coupling tube, and means sealingly joining the jacket sleeve with the jackets whereby the male ends of the units are slidably sealed with the female ends of adjacent units to accommodate expansion and contraction of the conduit system and the mated conduit ends are insulated by the insulation ring with the insulation ring being sealed by the jacket sleeve.

4,084,843

QUICK-ACTING HOSE OR PIPE COUPLING

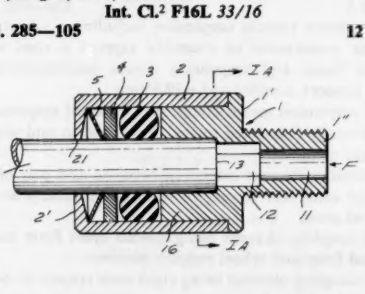
Willy Gassert, Hauptgasse 59, Solothurn, Switzerland (CH-4500)

Filed Apr. 30, 1976, Ser. No. 682,034

Claims priority, application Switzerland, May 2, 1975, 5711/75; Aug. 1, 1975, 10165/75

Int. Cl.² F16L *33/16*

U.S. Cl. 285—105 **12 Claims**



1. A quick-acting coupling for connecting a source of pressure fluid to a tube, comprising:

a housing having a shell centered on an axis of an associated nipple, a first end wall transverse to said axis with an inlet for axial admission of said pressure fluid and a second end wall transverse to said axis with an opening for the axial insertion of an extremity of said tube;

at least one dished annular spring in peripheral contact with said shell, said spring having a pair of faces assuming in its unstressed state a frustoconical shape convex toward said inlet, said spring being disposed in said housing coaxially with said shell adjacent said second end wall and having a central aperture in line with said opening for penetration by the inserted tube extremity;

centering means for said tube extremity in said housing including an annular thrust member axially slidable in said shell and coaxially juxtaposed with said spring between the latter and said first end wall, said centering means forming a socket of the same diameter as said opening and aligned therewith for receiving the end of the inserted tube extremity, said central aperture having a diameter slightly exceeding that of said socket and of said opening in said unstressed state whereby said tube extremity can be freely inserted and withdrawn without contacting said spring, said thrust member being axially shiftable by the pressure of fluid from said source for deforming said spring into gripping engagement with said tube extremity; and

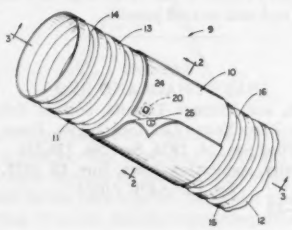
indexing means in said housing for releasably arresting said thrust member in an advanced position in which said spring is held deformed.

4,084,844

DEVICE FOR CONNECTING CORRUGATED DRAINAGE TILES AND THE LIKE

Larry David Abner, R.R. 1, Norman, Ind. 47264

Filed Dec. 27, 1976, Ser. No. 755,152
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—373 **3 Claims**



1. A device for coaxially connecting drainage tiles and the like having external, circumferential channels which comprise:

a sleeve member having a first end a second end, said sleeve member including a plurality of spaced apart tabs extending from a first side of said sleeve member and adapted to be received within the circumferential channels in coaxial, corrugated drainage tiles; and

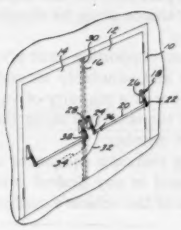
means for securing the first end of said sleeve member adjacent to the second end of said sleeve member to secure said sleeve member about the corrugated drainage tiles with the tabs received within the circumferential channels of the corrugated drainage tiles, said means is for securing together the first and second ends in overlapping relation, said means including a first tab adjacent the first end of said sleeve member, the first tab extending from a first side of said sleeve member and being adapted to be received within a circumferential channel in a corrugated drainage tile, the first tab having an interior chamber including an opening at the second side of said sleeve member, said means further including a second tab adjacent the second end of said sleeve, the second tab extending from the first side of said sleeve member and adapted to be received within the interior chamber of the first tab.

4,084,845

SECURITY LOCK FOR EMERGENCY DOOR LATCH MECHANISM

Robert L. Eckert, 11231 Foster Rd., Los Alamitos, Calif. 90720

Filed Jun. 14, 1976, Ser. No. 695,792
Int. Cl.[2] E05C *15/02*
U.S. Cl. 292—92 **9 Claims**



1. A security lock for door latches and the like having a crash bar extending transversely across the inner face of a door and mounted at its opposite ends by each of a pair of parallel bar arms that are pivotally carried by pin means on side bracket means secured to said door and that are mechanically linked to move the bolt of said latch between closed and open positions which comprises:

a bracket arm with means for its pivotal mounting to said side bracket means;

cover bar means mounted on the free end of said bracket arm and extending therefrom to overlie a distal portion of said crash bar; and

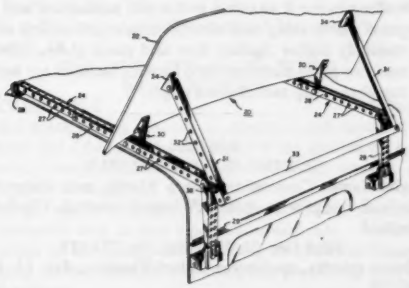
locking means mounted on said bracket arm for fixedly restraining said bracket arm in a raised position against pivotal movement while permitting said crash bar to move between latch closed and latch open positions.

4,084,846

UNIVERSAL SUPPORT ASSEMBLY FOR DRAG REDUCING EQUIPMENT

Nathaniel C. Wiley, Jr., Weston, and William L. Jensen, Jr., Beacon Falls, both of Conn., assignors to Rudkin-Wiley Corporation, Stratford, Conn.

Filed Aug. 20, 1976, Ser. No. 716,127
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S **19 Claims**



1. Apparatus for supporting and securely mounting drag reducing equipment to a land transport vehicle comprising:

A. a telescoping, interlocking, elongated support member, adjustably securable and firmly lockable in a plurality of various lengths;

B. a first bracket pivotally secured to a forward portion of the elongated support member and positioned for bolting directly to the roof of the land transport vehicle;

C. a second bracket

a. pivotally secured to a rear portion of the elongated support member, and

b. adjustable in a plurality of lengths for securement to the land vehicle at the optimum location regardless of the vehicle configuration;

D. a drag reducer support bracket pivotally secured to the elongated support member and adjustably securable in a plurality of positions along the elongated support member; and

E. a drag reducer supporting strut pivotally secured to the drag reducer and adjustably securable to the elongated support member in a plurality of various positions along the length of the strut and along the length of the elongated support member

whereby the drag reducing equipment can be securely supported and mounted in any desired orientation to any land vehicle regardless of the vehicle's configuration.

4,084,847

SEAM IN A BODY OUTER PANEL OF A VEHICLE

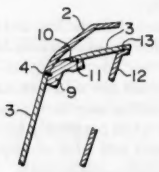
Masatsune Kondo; Yoshiaki Sawami, and Yukio Tamura, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 29, 1976, Ser. No. 709,723

Claims priority, application Japan, Aug. 6, 1975, 59-95561

Int. Cl.² B62D *27/00*

U.S. Cl. 296—28 R **6 Claims**



1. A seam structure for a body outer panel of an automobile, comprising:

a roof panel having a downward directed edge;

a rear quarter panel having an inwardly curved upper end portion having a slit opening and an upper extension located above said slit opening for connection with a third member;

said slit opening defining an upward directed edge to abut said downward directed edge of said roof panel; and

a backing member attached to the rear surfaces of said two panel plates along said abutted edges and having a substantially higher rigidity than said panel plates, wherein said two panel plates and said backing member are welded together along said abutted edges.

4,084,848

SLIDING ROOF ASSEMBLY

Douglas James Cunningham, Steep Marsh, near Petersfield, England, assignor to Britax (Wingard) Limited, Chichester, England

Filed Dec. 22, 1976, Ser. No. 753,117

Claims priority, application United Kingdom, Jan. 14, 1976, 01407/76

Int. Cl.² B60J *7/02*

U.S. Cl. 296—137 E **9 Claims**

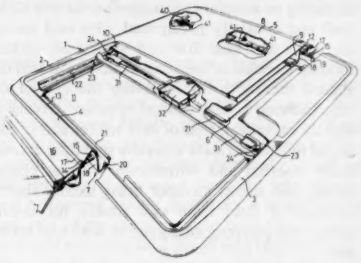
1. A sliding roof assembly for insertion in an opening in a vehicle roof, comprising:

a support structure, said structure being a single piece pressing in the shape of a rectangular frame, said frame having an opening defined by a pair of opposed side members and front and rear cross members;

a rear half of said frame opening being closed off by a first panel, said first panel being integral with said side members and said rear members;

said frame being peripherally bounded by a flange which is integral with and projects outwardly from said members and said front and rear members;

said flange including an upstanding edge which is defined by a first wall which projects downwardly into the frame opening and a second wall which slopes downwardly to a free edge on each side of said frame, each of said free



edges also being defined by an inwardly projecting lip which is provided to rest on the upper surface of the vehicle roof when the support structure is fitted thereto, said inwardly projecting lip being a straight member and having holes for receiving concealed rivets;

a second panel secured to the support structure in overlapping but spaced relationship with the first panel to define a recess therebetween; and,

a closure panel slidably mounted within the support structure and movable between a closed position, in which it closes the frame opening in the front half of said frame, and an open position in which it lies in the recess between said first and said second panels.

4,084,849

BABY CHAIR AND BED

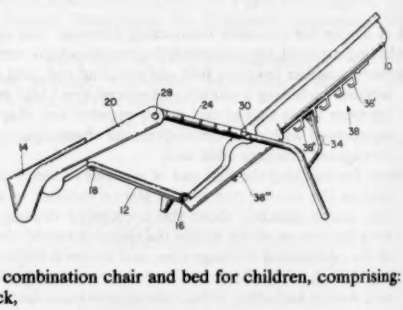
Hajime Ishida, and Mitsuyo Tsumita, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Sep. 24, 1976, Ser. No. 726,231

Claims priority, application Japan, Nov. 15, 1975, 50-155262

Int. Cl.² A47C *1/034*

U.S. Cl. 297—22 **6 Claims**



1. A combination chair and bed for children, comprising:

a back,

a seat,

means connecting said back and said seat permitting same to rotate with respect to each other,

a footrest provided with arms on each side thereof,

means connecting said seat and said footrest permitting same to rotate with respect to each other,

a support rod having leg portions spaced apart from each

other terminating in ends and an intermediate connecting portion,

means connecting said ends of said leg portions of said support rod to said arms of said footrest permitting same to rotate with respect to each other,

means connecting said leg portions of said support rod to said back permitting same to rotate with respect to each other,

a locking rod having ends and an intermediate portion,

means connecting said ends of said locking rod to said leg portions of said support rod permitting same to rotate with respect to each other, and

means connecting said intermediate portion of said locking rod to said back at a plurality of positions along said back,

all of said means cooperating so that the components thereof can substantially form a bed in one position thereof, substantially form a chair in another position thereof, and be collapsed for carrying and storage.

4,084,850

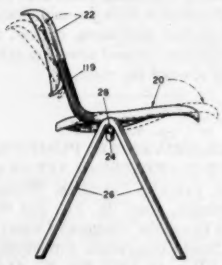
CHAIR

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 586,794, Jun. 13, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 721,164

Int. Cl.² A47C *1/02*

U.S. Cl. 297—317 **36 Claims**



1. A chair comprising a frame that includes at least one back support, a seat-supporting structure, and means rigidly connecting the back support to the seat-supporting structure; a back mounted on the back support, and a seat mounted on the seat-supporting structure, the seat-supporting structure including at least one elongated member that extends lengthwise of the chair under the seat and has an elongated front portion rigidly supported from the rear in cantilevered relation to the remainder of the chair frame, the at least one elongated member having thereon laterally spaced-apart parallel elongated seat supports, the seat supports being of substantially uniform external cross-section throughout their lengths and having axes extending lengthwise of the chair in substantially parallel vertical planes, and the seat having a pair of laterally spaced-apart elongated sleeves, each of which is of substantially uniform internal cross-section along its length, is substantially coextensive with a corresponding seat support, and receives a corresponding one of the seat supports in sliding relation therein, such that the seat is slidable backward and forward on the seat supports, means resiliently urging the seat to its rearward limit position on the seat support, coacting means on the seat and the seat supports for limiting the extent of movement of the seat on the seat supports, and means mounting the back on the back support for tilting movement independently of movement of the seat about a substantially horizontal transverse axis and resiliently urging the back about said axis to a relatively upright position.

4,084,851

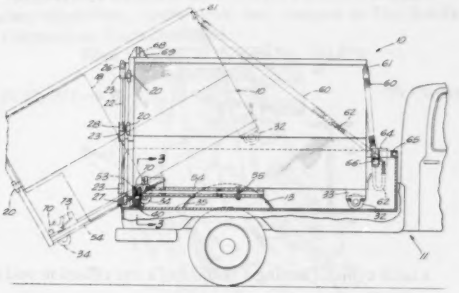
DETACHABLE, SELF-DUMPING, SELF-RETRACTING CARGO BIN FOR PICKUP TRUCKS

William W. Duncan, Sr., 4771 E. Live Oak, Lodi, Calif. 95240

Filed Feb. 25, 1977, Ser. No. 772,088

Int. Cl.² B60P *1/30*

U.S. Cl. 298—14 **12 Claims**



10. That improvement in a pickup truck having a cargo space rearward of the driver's compartment which improvement comprises:

a self-dumping self-retracting cargo bin having a normally closed closure for the rear end thereof and provided on the opposite ends of the bottom thereof with roller means movably supporting said bin for rolling movement lengthwise of said truck cargo space and along a floor when demounted from said cargo space;

fulcrum means readily mounted at the rear end of said truck cargo space and attachable to and detachable therefrom without need for tools and including roller means engageable with stop means near the midlength of said cargo bin on which said bin can pivot downwardly to dump the contents thereof as said bin rolls partially out of the rear end of said cargo space; and

tension spring means having the upper end thereof fixed to the upper forward end of said bin and the lower end thereof readily detachably connected to said truck forwardly of the forward end of the bin when retracted into the truck cargo space and effective to tilt and retract the bin automatically back to the forward end of said cargo space as an incident of the final phase of dumping the contents thereof.

4,084,852

ROLL-OVER PROTECTION STRUCTURE FOR DUMP TRUCK

John R. Prosek, Glen Ellyn, and James C. Tamburino, Roselle, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jul. 22, 1976, Ser. No. 707,802

Int. Cl.² B60P *1/00*

U.S. Cl. 298—22 C **3 Claims**

1. In a truck having a frame, an operator's cab mounted on the frame and a dump body capable of being pivoted between a lowered transport position and a raised dump position, the improvement comprising;

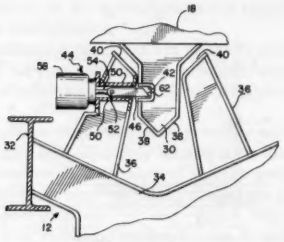
a canopy rigidly secured to the dump body and projecting forwardly over at least a portion of said cab;

a central rib affixed to, and extending a substantial distance along the underside of said body and projecting outward therefrom;

a pair of centering towers rigidly affixed to the frame and defining a pocket therebetween for reception of said rib, said towers and said rib, when positioned in said pocket, serving to maintain the dump body in its normal transport position upon application of a side load to the dump body;

slanted surfaces on said rib and said towers for guiding said

rib into said pocket as the body is pivoted to its lowered position;
a guideway carried by one of said towers;
a latch bolt reciprocable within said guideway;
a recess in said rib capable of registry with said latch bolt;



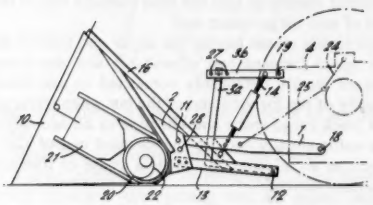
a latch cylinder having a piston and a rod affixed to said one tower;
a compression spring trapped within said latch cylinder behind said piston; and
means for directing fluid pressure to the latch cylinder to retract said latch bolt from said recess.

4,084,853

HOPPER DEVICE FOR TRACTOR VEHICLES

Richard Keenan, Walcott, Bagenalstown, County Carlow, Ireland, assignor to Richard Keenan; Patrick Keenan and John Keenan, Ireland, part interest to each

Filed Feb. 24, 1976, Ser. No. 660,795
Claims priority, application Ireland, Feb. 24, 1975, 381/75
Int. Cl.[2] E02F 5/00
U.S. Cl. 298—24 **8 Claims**



1. The combination of a tractor vehicle and a hopper mounted on the tractor vehicle, said hopper having a plurality of sides and a bottom and movable from a lower position to a raised position, a pair of lifting links pivoted on a portion of the tractor vehicle below the rear axle thereof the tractor having an upper anchorage point thereon above said axle, a pivot in the region of the bottom of the hopper for the pivotal attachment of each lifting link to the hopper, an arm extending downwardly below the bottom of the hopper in said raised position, a pivot bearing on said arm spaced from the hopper bottom and a connecting link extending downward below said lifting links to provide a pivotal connection between said pivot bearing and said upper anchorage point on the tractor vehicle.

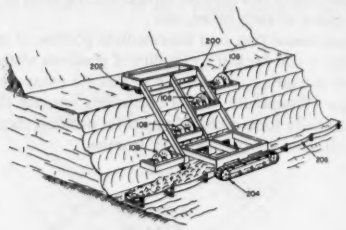
4,084,854

DRAG BIT EXCAVATION

Carl R. Peterson, Boxford, Mass., assignor to Rapidex, Inc., Burlington, Mass.

Filed Nov. 1, 1976, Ser. No. 737,068
Int. Cl.[2] E21C 27/22, 29/24
U.S. Cl. 299—57 **3 Claims**

1. In a drag bit excavating device having a plurality of cutting elements, each said element comprising
a core extending along an axis,
a bit carrier supported on said core,
cutter bits supported by said carrier along a three dimensional spiral having constant pitch and increasing radius along at least a portion of said axis,
said carrier being relieved to provide radially extending spaces between the turns of said spiral,
a frame supporting said core, carrier, and bits for rotation about and advance parallel to said axis, and,
a drive to provide said rotation, whereby said bits slot the



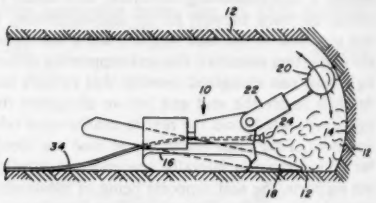
material to be excavated while said material between portions of the resulting slot extends into said spaces to be subsequently broken away,
that improvement comprising support means for supporting said elements in an array sloping along a plane with their respective said axes parallel to each other, said plane sloping in a direction transverse to said axes, said axes being spaced along said plane in said direction of slope, said elements having their drives arranged so that each core, carrier, and bit assembly rotates clockwise when viewed along its axis with said plane sloping upwardly toward the right.

4,084,855

WATER-DRIVEN AIR PUMPING AND DUST-SUPPRESSING APPARATUS

Roscoe C. Miles, Franklin Township, Westmoreland County, Pa.; Joseph Subrick, Gary, W. Va., and Woods G. Talman, Upper St. Clair Township, Allegheny County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 24, 1975, Ser. No. 644,251
Int. Cl.[2] E21C 7/08
U.S. Cl. 299—64 **10 Claims**



1. Fluid-driven air-pumping and mixing apparatus for mixing and diluting impurities in the air with a fluid, said apparatus comprising:
a housing including means defining a longitudinal passage therethrough, said passage defining means being configured having an inlet at one end thereof co-axially located relative to said longitudinal passage, through which air and impurities may enter said housing, and an outlet at the other end, for permitting the exit of the mixed and diluted impurity-air-fluid mixture from said housing, said passage defining means proximate said outlet being configured having substantially linearly arranged diverging interior wall segments for defining a mixing chamber; and
a fluid-dispersing air-driving nozzle, said air-driving nozzle being configured to disperse a solid cone of such fluid

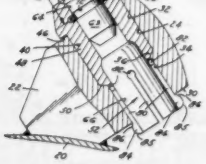
outwardly toward said outlet, said nozzle being positioned centrally within said passage co-axially with respect to said passage and being of a size substantially smaller than said passage for permitting the passage of such air and impurities entering through said inlet to pass thereby, said nozzle having an angle of fluid divergence greater than the angle of divergence of said interior wall segments relative to said longitudinal axis, said nozzle being located substantially along the longitudinal axis of said passage such that the outer portion of its divergent fluid cone impinges on said divergent interior wall segments no further backstream than the beginning of the divergence of said interior wall segments, thereby maximizing the air flow through said passage and outwardly through said outlet as well as mixing such impurities in said mixing chamber with the air and with such fluid.

4,084,856

SELF-RETAINING SLEEVE AND BIT

Kenneth C. Emmerich, and Ralston L. Hamlin, both of Lexington, Ky., assignors to Fansteel Inc., North Chicago, Ill.

Division of Ser. No. 656,743, Feb. 9, 1976. This application Sep. 7, 1976, Ser. No. 720,945
Int. Cl.[2] E21C *35/18*
U.S. Cl. 299—86 **2 Claims**



1. A support member for supporting a tool having:

(a) a tool bit with a pointed forward portion and a solid cylindrical rearward shank portion with said portions being co-axial, said support member including a hollow tubular sleeve having an inside diameter adapted closely but freely rotatably to receive the rearward shank portion of the tool bit and having an outside diameter adapted rotatably to be received in a bore in a support block,

(b) said hollow tubular sleeve having at least two circumferentially spaced apart slots extending generally axially therein from the rear end to form at least two finger portions each integral with said sleeve and each being resilient and generally yieldable radially inward adjacent the rear end of the sleeve,

(c) an integral radial projection on the outside of each finger and adjacent the rear end of the sleeve and constructed and arranged for engagement with the support block at the rear end of the bore in the support block to releasably retain the sleeve in assembled relation therewith while permitting the sleeve to rotate freely in the support block,

(d) said sleeve having a rearwardly facing element of abutment means for engagement with the support block and a forwardly facing element of abutment means for engagement with the tool bit, and

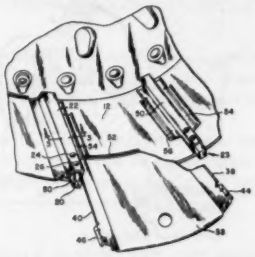
(e) means forming a groove in said bore of said sleeve and means forming a groove on the outside of said tool bit rearward shank portion, said grooves being in axial registry when said rearward shank portion of said tool bit is received in said bore of said sleeve with said abutment means engaging each other, said groove in said sleeve being a relatively deep groove in comparison to the groove in said tool bit rearward shank portion, and a resilient ring retained in said sleeve groove having an inner diameter slightly smaller than said tool bit rearward shank portion so as to engage in said groove of said tool bit rearward shank portion to releasably retain said tool bit in assembled relation with said sleeve while permitting relative free rotation of said tool bit and said sleeve.

4,084,857

DRIVE KEY HEAT SHIELD AND SUPPORT FOR WHEEL RIM HEAT SHIELD OF MULTIPLE DISC BRAKE

Jaring VanderVeen, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 20, 1976, Ser. No. 752,574
Int. Cl.[2] B60B *19/00*
U.S. Cl. 301—6 A **10 Claims**



1. A wheel and heat shield assembly comprising:

a tire supporting wheel rim defining a brake cavity adapted to receive a brake assembly, said brake assembly having rotatable and non-rotatable frictionally engageable members;

circumferentially spaced elongated drive key means carried by said wheel rim said drive key means extending radially inwardly from said wheel rim into engagement with said rotatable members;

a plurality of rim heat shield members each being independently and removably secured in position between said drive key means to define a substantially continuous annular wall having radially spaced-apart relationship to said wheel rim; and

each of said drive key means including a boss member carried by said wheel rim, a cap key member removably secured to said boss member so that said cap key member engages said rotatable members, and a key boss cap heat shield member disposed between said cap key member and said boss member, with said key boss cap heat shield member extending over said boss and interconnecting adjacent said rim heat shield members, said interconnection adapted to maintain said independent removability of said rim heat shield members from said assembly.

4,084,858

UNCOUPLING VALVE WITH OVERRIDE FEATURE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Mar. 30, 1977, Ser. No. 783,037
Int. Cl.[2] B60T *7/12*
U.S. Cl. 303—18 **7 Claims**

1. In combination with a rail car brake system having a supervisory pneumatically pressurized pipe for controlling braking operations, an improved coupler valve circuit for interconnecting supervisory pipes in adjacent rail cars, said valve circuit comprising:

a valve body adapted to be attached to said supervisory pipe;

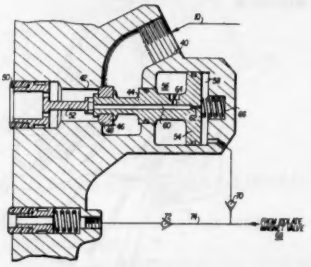
a bore in said valve body communicating with said supervisory pipe, said bore having a valve seat therein;

a valve carrier mounted for translation in said bore, said carrier having a valve element adapted to contact said valve seat to prevent flow of fluid from said supervisory pipe through said bore;

extension means attached to said valve carrier for contacting a like extension means in an adjacent car and for holding said valve element away from said valve seat when two cars are coupled;

piston means attached to said valve carrier for translation therewith in said bore, said bore defining a first chamber on one side of said piston and a second chamber on the other side of said piston;

means for pressurizing both said first and second chambers to the pressure in said supervisory pipe when said valve element is out of contact with said valve seat;



means for permitting one of said first and second chambers to depressurize more rapidly then the other to momentarily hold said valve element out of contact with said valve seat, whereby said supervisory pipe depressurizes when two adjacent cars are accidentally uncoupled; and

means for selectively pressurizing the other of said first and second chambers to force said valve element into contact with said valve seat, whereby said supervisory pipe remains pressurized when two adjacent cars are intentionally uncoupled.

4,084,859

TOWED VEHICLE BRAKE

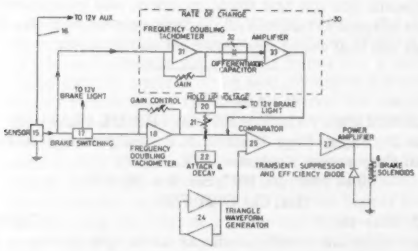
Jeffrey Lawrence Bull; Tanya Ellen Murphy, and Laurence Ernest Gibson, all of Adelaide, Australia, assignors to Ian R. Murphy, Valley View, Australia, by said Tanya Ellen Murphy

Filed Mar. 21, 1977, Ser. No. 779,497

Claims priority, application Australia, Mar. 25, 1976, PC5352/76

Int. Cl.[2] B60T *8/02*

U.S. Cl. 303—106 **3 Claims**



1. A braking system for towed vehicles in which the towed vehicle has electrically energised brakes which comprises,

(a) electrical slave means including a solenoid on the brakes of the towed vehicle to apply the said brakes proportionally to current applied to said solenoid,

(b) a speed sensing device mounted on at least one wheel of the said towed vehicle, said speed sensing device comprising an electrical sensor to produce pulses in proportion to the speed of rotation of said wheel,

(c) a "rate of change" circuit connected between the said speed sensing device and the said slave means on the brakes arranged to measure the frequency of the pulses of the speed sensing device and to increase braking force in proportion to a rate of decrease in the number of pulses as determined by the speed sensing device, said electrical means comprising a frequency doubler tachometer receiving said pulses, a wave form generator, a comparator receiving pulses from the said frequency doubler and the said wave form generator, and a power amplifier receiving the signal from the said comparator and applying pulsed direct current to the said solenoid in proportion to the frequency of the pulses generated in the said sensor, and

(d) a switch in the said electrical connecting means between the sensor and the brake solenoid to initiate braking when said switch is energised by the brake light circuit of the vehicle.

4,084,860

APPARATUS FOR MOUNTING AN OPEN END SPINNING TURBINE

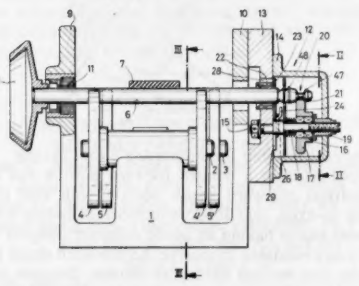
Gisbert Kohler, Offingen, Hanns-Wilfried Munkel, Stuttgart; Hubert Pohl, Waiblingen; Walter Sommer, Leonberg, and Gunther Wendel, Stuttgart, all of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed May 26, 1976, Ser. No. 689,962

Claims priority, application Germany, May 31, 1975, 2524231

Int. Cl.[2] F16C *3/00, 35/00*

U.S. Cl. 308—15 **26 Claims**



1. Apparatus for mounting an open end spinning turbine located at the front end of a drive shaft and having means for rotating said drive shaft, comprising a bearing block having a pair of spaced walls transversed by said drive shaft and roller means located between said walls forming a V groove support for said drive shaft, the rear end of said shaft extending outwardly of the rear wall of said bearing block and having an annular T-slot formed therein, a bushing mounted in said wall for journalling said shaft and a guide member extending within said T-slot to thereby fix the axial position of said shaft within said supporting roller means.

4,084,861

THRUST BEARING DAMPING MEANS

Paul B. Greenberg, Manchester, Conn., and Stephen D. Patterson, North Palm Beach, Fla., assignors to United Technologies Corporation, Hartford, Conn.

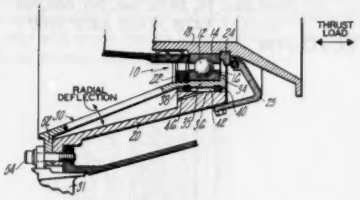
Filed Nov. 11, 1976, Ser. No. 740,891

Int. Cl.[2] F16C *27/00*

U.S. Cl. 308—26 **6 Claims**

1. For a thrust bearing rotatably supporting a shaft having a rotor developing thrust, support means having an annular portion concentric to and spaced from said thrust bearing, a radially flexible support means mounted between said thrust bearing and said support means normally supporting said

thrust bearing, said radially flexible support means having a concentrically disposed annular portion defining between its outer diameter and the inner diameter of the annular portion of said support means a cavity for supporting an oil film for



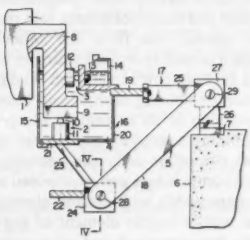
damping out vibration manifested by said shaft being transmitted thereto through said radially flexible support means and means securing said radially flexible support means and said support means so that thrust loads are transmitted to said securing means through said radially flexible support means.

4,084,862

THRUST SUPPORT SYSTEM FOR VERTICAL SHAFT ROTARY MACHINE

Isao Ishida, Takahagi; Hiroshi Sato, and Sho Kusumoto, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 20, 1976, Ser. No. 716,223
Claims priority, application Japan, Sep. 11, 1975, 50-110376
Int. Cl.[2] F16C *3/00*
U.S. Cl. 308—139 **7 Claims**



1. A thrust support system for a vertical shaft rotary machine, comprising a bearing oil tank adapted to be disposed around the vertical shaft of said vertical shaft rotary machine; a stand provided around said bearing oil tank; and means for supporting said oil bearing tank on said stand; said supporting means including: a lower ring member connected to the bottom portion of said bearing oil tank; legs mounted on said stand; a plurality of connecting members extending obliquely upwardly of said ring member and connecting said ring member to said legs; and a member for preventing said leg of the stand from moving in the diametral direction.

4,084,863

BEARING AND BEARING LINER HAVING A COMPLIANT LAYER

Alfred J. Capelli, Palos Verdes Peninsula, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

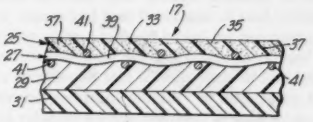
Filed Jan. 25, 1974, Ser. No. 436,670
Int. Cl.[2] C10M *5/00*; B32B *3/00*
U.S. Cl. 308—238 **21 Claims**

1. A bearing liner for attachment to a substrate having at least one projection thereon, said bearing liner comprising:

a wear resistant layer including a porous backing member and a binder and particles of a lubricating material dispersed in the binder, said wear resistant layer having a wear surface;

said wear resistant layer being relatively thin and being provided with properties to be deformable under load whereby application of said wear resistant layer directly to said substrate would cause the projection to cause a protrusion on the wear surface; and

a compliant layer disposed between the wear resistant layer and the substrate, said compliant layer being relatively thin and being provided with resiliently deformable properties to provide for resilient compression of the compliant layer at the position of the projection whereby the tendency of the projection to cause the protrusion is minimized;



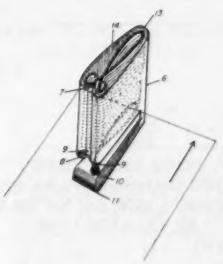
the thickness of the compliant layer being at least as great as the height of the projection on the substrate but less than twice the height of the projection on the substrate.

4,084,864

SCISSOR STYLE PAPER CLIP AND AUTOMATIC DISPENSER FOR SAME

Nelson S. Kibler, 246 Avondale Dr., Sterling, Va. 22170

Filed Jul. 13, 1976, Ser. No. 704,951
Int. Cl.[2] A47F *1/08*; B65D *83/08*
U.S. Cl. 312—42 **1 Claim**



1. In combination, a device for dispensing paper clips and a paper clip, said device comprising guide means, a base, a vertical tubular housing, a notch in said base, a lip, and a space between said housing and said base, said lip being disposed at a lower end of said housing and above said space, said notch being disposed in said base and below said space, said paper clip comprising a length of resilient wire having a bend portion at the midpoint whereby two shanks are formed, said shanks crossing each other at substantially two-thirds of their length, said shanks being bent at their free ends to form pads, whereby when said paper clips are stacked in said device, said guide mates with a gap between said pads and the lowermost paper clip in said space of said device is supported by said pads which engage said lip and said notch, and whereby when a sheet of paper or similar material is placed in said space, said lowermost paper clip engages said sheet and is removed with said sheet when said sheet is withdrawn from said space.

4,084,865

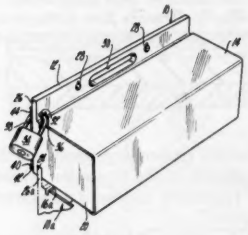
UTILITY CONTAINER

James E. Joyce, 878 Darien Cir., Rochester, Mich. 48063

Filed Oct. 26, 1976, Ser. No. 735,845
Int. Cl.[2] B65D *43/12*, *1/24*
U.S. Cl. 312—111 **30 Claims**

1. A multipurpose, internally alterable, utility storage container comprising: a container body having laterally opposed

side panels and at least one body panel, said body panel being disposed perpendicularly to and integral with said side panels, thereby retaining said side panels in a spaced substantially parallel relationship; a cover, movably disposed over the open portion of said container body, to open and close the container body; and an insert receiving system comprising a plurality of



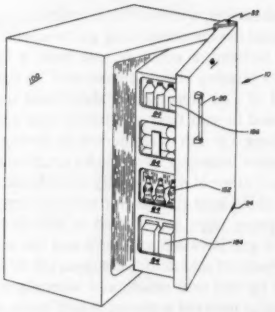
spaced slots and apertures integral with said side panels and interior of said body for receiving removable inserts for horizontal and vertical compartmentalization within the body, said inserts having integral bosses, tabs and ribs which matingly cooperate with said slots and apertures, whereby the interior of said body may be reconfigured by insertion and removal of drawers and inserts.

4,084,866

DOOR STRUCTURE

Kikuo Hayashi, 21452 DeQuindre, Warren, Mich. 48091

Filed Nov. 3, 1976, Ser. No. 738,587
Int. Cl.[2] A47B *77/08*
U.S. Cl. 312—138 R **16 Claims**



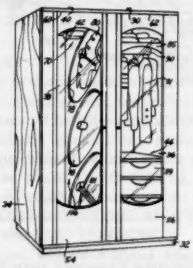
1. A door comprising a door member having an interior surface and opposite edge surfaces, hinge means mounted on one of said edge surfaces, a plurality of spaced-apart rear opening shelves extending inwardly of said interior surface, said rear-opening shelves having access openings in said interior surface, and a plurality of spaced-apart edge opening shelves extending inwardly of said other edge surface, said edge-opening shelves having access openings in said other edge surface, whereby access is provided to said edge opening shelves when said door is partially open.

4,084,867

STORAGE CABINET FOR SKI EQUIPMENT

Bernard J. Putt, Star Rte. Box 169, Howard, Colo. 81233, and Roger E. Hughet, 5635 Putnam, West Bloomfield, Mich. 48033

Filed Jan. 14, 1976, Ser. No. 648,905
Int. Cl.[2] A47B *53/00;* **A47F** *7/00*
U.S. Cl. 312—198 **1 Claim**



1. A storage cabinet for storing a plurality of wet ski boots which comprises:

a walled compartment;

a drain mounted proximate the base of said compartment;

a molded panel mounted on at least one of the walls of said compartment, said panel having a plurality of oval-shaped receptacles formed therein of substantially the same size; said receptacles having their longitudinal axes substantially parallel and trans-horizontal, said receptacles further vertically spaced one from the other and vertically aligned, each of said receptacles further having means for securing a ski boot pair in mounted relationship therein; a boot carrier for holding each of said boot pairs in sole to sole relationship in its respective receptacle, each boot carrier including a stand element at one end and a handle element at the other end, said securing means in said receptacles comprising a pair of opposed securing resilient clips one engageable with a stand element and the other engagable with a handle element of the associated boot carrier, the lowermost of said receptacle adapted to receive water drainage seriatim from those above it and to pass such water to said drain.

4,084,868

MOVING DISPLAY RACK

J. Frank Lummus, 1232 Grove Park La., Columbia, S.C. 29210

Filed Feb. 25, 1977, Ser. No. 771,893
Int. Cl.[2] A47F *3/08;* **A47B** *49/00*
U.S. Cl. 312—268 **1 Claim**

1. A moving display rack, comprising

a cabinet having a top, a bottom, a side extending between the top and bottom and a display window in the side;

a plurality of pairs of sprocket wheels rotatably mounted in the cabinet with the wheels of each pair spaced from each other in substantially parallel relation and approximately half the pairs of sprocket wheels being mounted in the area of the top of the cabinet and the remaining pairs of sprocket wheels being mounted in the area of the bottom of the cabinet;

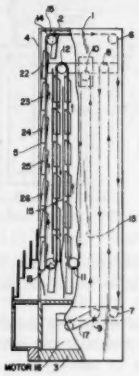
a pair of endless carrier chains each mounted on a corresponding one of the sprocket wheels of each pair of sprocket wheels and extending between the sprocket wheels in meandering fashion;

motive means coupled to a selected pair of the sprocket wheels for rotating the sprocket wheels and moving the carrier chains through the cabinet and past the window of the cabinet in a predetermined direction;

a plurality of bars affixed to the pair of carrier chains and

extending therebetween substantially perpendicularly thereto in equidistantly spaced relation;

a plurality of trays for supporting items to be displayed, each of the trays being removably rotatably mounted on a corresponding one of the bars, each of the trays having a box-like configuration with an open front facing the window, a spring-biased retainer device for retaining an item in the tray and guide means for maintaining the tray upright in its journey through the cabinet; and



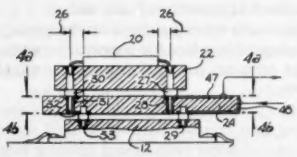
a plurality of pairs of guide strips of magnetizable material in the cabinet in the area of the window, each of the trays having eight corners and the guide means of each tray comprising a pair of magnetic guide wheels rotatably mounted on the bottom front corners for rotating on the guide strips and a plurality of cushion wheels each rotatably mounted on a corresponding one of the remaining corners.

4,084,869

INTERCONNECTOR FOR INTEGRATED CIRCUIT PACKAGE

Yao T. Yen, Cupertino, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Nov. 10, 1976, Ser. No. 740,390
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **2 Claims**



1. A connector apparatus for providing coupling between a dual in-line integrated circuit package, a circuit connector adaptable for receiving said package, and a cable, comprising:

a cable having first and second leads;

a printed circuit board;

a first connector means on said board having a plurality of openings on the upper surface of said board for receiving said integrated circuit package, said first connector means having first and second contacts;

a second connector means including a plurality of pins extending from the lower surface of said board for engaging said circuit connector, said pins coupled to first and second contacts of said second connector means;

a first plurality of lines on said board for providing electrical paths between said first contacts of said first connector means and said first contacts of said second connector means;

a second plurality of lines on said board for providing electrical paths between said second contacts of said first connector means and said first leads of said cable;

a third plurality of lines on said board for providing electrical paths between said second contacts of said second connector means and said second leads of said cable;

said first, second and third plurality of lines being arranged in parallel relation to one another, at least some of said first, second and third plurality of lines being disposed on the underside of said board, the remaining lines being disposed on the upper side of said board,

said first and second connector means and said first, second and third plurality of lines on said board for maintaining said integrated circuit package in close proximity to said circuit connector when said apparatus is disposed between said package and circuit connector;

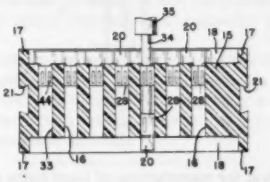
whereby signals are directly coupled between said circuit connector and said integrated circuit package and whereby other signals are intercepted from the circuit connector and replaced with signals from said cable.

4,084,870

MINIATURE MATRIX PROGRAMMING BOARD

Gregory L. Laserson, Scarsdale, and Miklos Madarasz, Harrison, both of N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Mar. 14, 1974, Ser. No. 451,213
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—18 P **8 Claims**



1. A matrix connector for selectively connecting a cross bar in a first series of parallel bars with a similar cross bar in a second series of parallel bars comprising:

(a) an insulator block for supporting both series of parallel bars, formed with a plurality of spaced cylindrical holes connecting two plane surfaces and arranged in two orthogonal lines;

(b) a first series of elongated conductive bars in parallel array, each bar in the first series including a strip of conductive material formed with alternate ridges and grooves along its longitudinal axis and including a plurality of depending cylindrical sockets having resilient clamping walls, said sockets positioned in one end of the cylindrical holes in the insulator block;

(c) a second series of elongated conductive bars also in parallel array but perpendicular to the first series, each bar in the second series including a strip of conductive material formed with alternate grooves and ridges along its longitudinal axis and including a plurality of depending cylindrical sockets having resilient clamping walls, said sockets positioned in the other end of the cylindrical holes in the insulator block;

(d) a first cover plate secured to one side of the insulator block for covering one series of cross bars, said cover plate formed with a plurality of holes positioned in align-

ment with the holes in the insulator block for the insertion of connecting pins;

(e) a second cover plate secured to the other side of the insulator block for covering the second series of cross bars, said cover plate having a plurality of connecting pins removably connected thereto for making contact with a socket in each cross bar and for connection to an external circuit; and,

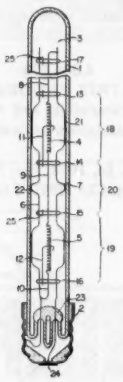
(f) a plurality of conducting connecting pins for insertion through the holes in the first cover plate to make contact with a socket in the first series of bars and a socket in the second series of bars.

4,084,871

METHOD FOR MANUFACTURE OF LAMP BULBS

Michiya Mashimo, and Hidehiro Shinada, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 15, 1976, Ser. No. 750,629
Claims priority, application Japan, Dec. 18, 1975, 50-150975
Int. Cl.[2] H01J *9/02*
U.S. Cl. 316—19 **9 Claims**



1. A method for manufacture of lamp bulbs comprising:

(a) steps providing a filament-supporting assembly, including:

(i) a first step of providing a wire assembly wherein more than three wires are extended in a straight line in parallel with each other, spaced apart from each other by a suitable distance and supported by a plurality of isolators which are made of an electrically insulating material and are spaced apart from each other by a suitable distance,

(ii) a second step of providing a plurality of lead wire pieces each extended into a predetermined space defined by the adjacent isolators and spaced apart from each other by a predetermined distance, each lead wire pieces being provided by cutting off a predetermined length of at least one of said wires except for at least two of the outermost ones in said predetermined space, and

(iii) a third step of electrically connecting said lead wire pieces to the outermost wires, whereby a filament-supporting assembly is provided, and

(b) a step of supporting a plurality of filaments each between at least two of said plurality of lead wire pieces on said filament-supporting assembly; and

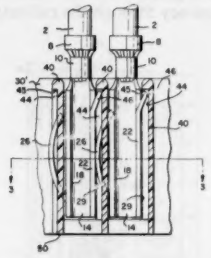
(c) a step of placing said filament-supporting assembly with said plurality of filaments supported thereon into a glass envelope and thereafter evacuating said glass envelope and sealing it.

4,084,872

ELECTRICAL COMMONING MEANS

James Pritulsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 18, 1977, Ser. No. 770,160
Int. Cl.[2] H01R *31/08*
U.S. Cl. 339—19 **3 Claims**



1. An electrical commoning means connecting a plurality of wires to each other at an electrical junction, said commoning means comprising:

a housing block of insulating material, said housing block being generally prismatic and having a terminal-receiving face, a plurality of side-by-side terminal-receiving cells extending inwardly from said face, adjacent cells in said housing block being separated from each other by spaced-apart parallel barrier walls, each of said barrier walls having an opening therein which extends from said face,

each of said wires having a contact terminal thereon, each of said terminals having a crimp portion and a flag-like contact portion which has a U-shaped cross section comprising a web and spaced-apart parallel sidewalls extending from said web, said web comprising an axial extension of said crimp portion, a first one of said sidewalls having a contact spring struck therefrom and extending laterally from the plane of said first sidewall, a retention ear extending from the second one of said sidewalls, said retention ear comprising a tab member which extends towards said wire and divergently from the plane of said second sidewall, said cells being dimensioned to receive said contact portions of said terminals with said sidewalls disposed against the opposed surfaces of adjacent barrier walls and with said contact springs extending through said openings,

polarizing means effective between said terminals and said cells effective to ensure insertion of said contact portions into said cells in a preferred orientation whereby said contact springs of all of said terminals engage said second sidewalls of adjacent terminals, and

each of said cells having a shoulder therein adjacent to said terminal-receiving face for cooperation with said ear of an inserted terminal for retaining said terminal in said cell whereby,

an electrical junction among a plurality of wires is formed by inserting said contact portions of said terminals on said wires into adjacent cells in said housing block.

4,084,873

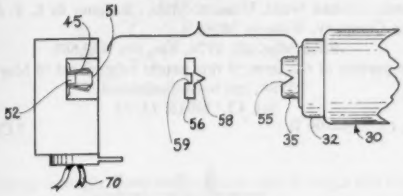
LAMP AND HOLDER COMBINATION WITH ADAPTER

Anton J. Grate, 3211 Burr Oaks Rd., Joliet, Ill. 60435

Filed Sep. 14, 1976, Ser. No. 723,096
Int. Cl.[2] H01R *33/08*
U.S. Cl. 339—52 R **4 Claims**

1. An improved fluorescent lamp, holder and adapter combination comprising an elongated, tubular lamp body, a generally flat base secured to each end of said body, each of said bases carrying a plug extending outwardly therefrom and including a pair of spaced electrical conductors, a lamp holder carrying a pair of spaced sockets each adapted to receive one of said plugs, one of said sockets including an irregularly shaped

socket recess, one of said lamp plugs having a groove therein extending parallel to the longitudinal axis of said lamp body and having a width less than the circumference of said plug, an adapter element interposed between said one of said lamp plugs and said one of said sockets, said adapter element being generally shaped as an oblong cylinder and carrying a tongue



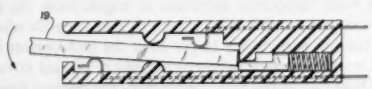
on one end extending within the outer boundaries of the cylinder and sized and shaped to lockingly nest within said groove in said plug and having its opposite end shaped complementary to said irregularly shaped socket recess for locking, mating engagement therewith, and means for providing electrical current to said lamp holder sockets and to said electrical conductors when the lamp is in place within the holder.

4,084,874

LOW INSERTION FORCE CONNECTOR

Thomas Georgopulos, Roselle, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jun. 27, 1977, Ser. No. 810,227
Int. Cl.² H05K *1/07*
U.S. Cl. 339—75 MP **7 Claims**



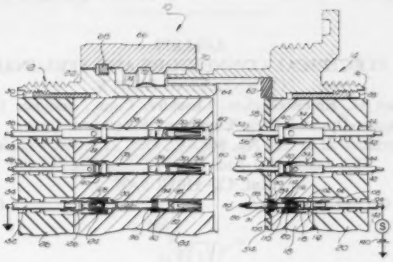
1. An electrical connector assembly for connecting to a printed circuit board and the like, having a plurality of spaced contacts carried by and adjacent one edge comprising: a body member having a circuit board receiving channel extending longitudinally along said body member for receiving said one edge of said printed circuit board having said spaced contacts, said circuit board receiving channel defined by a first and second interior wall and an interior bottom surface, a pair of opposing fulcrums intermediate the bottom and the opening edge, one on each said first and second interior walls, and leaving a space therebetween for the passage of a circuit board, a first series of conductive strips positioned along said first interior wall of said circuit board receiving channel between one of said pair of fulcrums and said interior bottom of said circuit board receiving channel, a second series of conductive strips positioned along said second interior wall of said circuit board receiving channel between the other of said pair of fulcrums and the opening edge of said circuit board receiving channel, a circuit board positioning groove in the interior bottom surface of said circuit board receiving channel for cooperating with said pair of fulcrums for positioning said circuit board when said circuit board is rotated in an arc about one of said fulcrums into increased contact against said first and second series of conductive strips and means to retain said circuit board in such position of increased contact.

4,084,875

ELECTRICAL CONNECTOR

Stephen K. Yamamoto, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 10, 1975, Ser. No. 540,252
Int. Cl.² H01R *13/52*
U.S. Cl. 339—94 M **4 Claims**



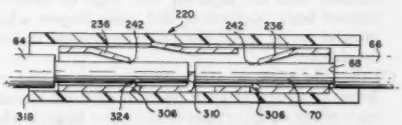
1. An electrical connector comprising:
an insulator having a bore therein;
a contact fixedly mounted in said bore, said contact having a forward contacting portion of a rear contacting portion;
a mating contact element is said bore behind said contact being in releasable electrical engagement with said rear contacting portion of said contact, said mating contact element incorporating means adapted for connection to a conductor passing outwardly through the rear of said bore;
said rear contacting portion of said contact being formed as a socket contact;
said mating contact element comprising a pin contact slidable into said socket contact;
a sleeve fixed to and surrounding said pin contact providing an annular space therebetween receiving said socket contact;
said sleeve having a rearwardly facing shoulder thereon; and
means releasably retaining said mating contact element in said bore, said retaining means comprising a radially inwardly forwardly extending resilient finger means in said bore engaging said shoulder.

4,084,876

ELECTRICAL CONNECTOR

Leon Joel Dinger, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 622,548, Oct. 15, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,809
Int. Cl.² N01R *7/28*
U.S. Cl. 339—95 D **1 Claim**



1. An electrical connector for electrically splicing two conductors together, comprising:
a. an elongated housing of insulating material having a passageway therethru; and
b. a coplanar strip of conductive material formed into an elongated, tube-like spring member with a flat top wall, an arcuate bottom wall and a passage therethru with a conductor-receiving opening at each end, a finger near each opening extending obliquely into the passage from the top wall with the free end pointing generally toward the opposite opening, said spring member further including a

tine near each opening extending obliquely into the passage from the lower wall with the free end pointing generally towards the opposite opening, said spring member being positioned in the housing passageway and adapted to

electrically connect two conductors which may be inserted into the openings and to retain said conductors against withdrawal by said fingers and tines gripping the conductors.

4,084,877

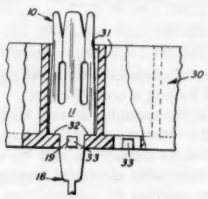
ELECTRICAL CONNECTORS AND TERMINAL CONNECTING BLOCK

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon-Dynamic Mfg. Company, Watertown, Conn.

Continuation of Ser. No. 868,417, Oct. 22, 1969, abandoned. This application Jun. 14, 1972, Ser. No. 262,495

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—97 P **2 Claims**



1. An electrical connector in the form of an integral spring metal piece comprising

(a) a flat base portion; and

(b) three contact fingers projecting from said base portion and lying at least substantially in the plane thereof, said three fingers including a symmetrical central finger and two outer fingers disposed each on a different side of said central finger,

(1) said central finger having a stem portion, a contact body portion and a tip portion, said stem portion commencing at said base portion and projecting therefrom and said contact body portion commencing at said stem portion and projecting outwardly to said tip portion,

(2) said stem portion of said central finger being narrower than said contact body portion of said central finger,

(3) each of said outer fingers having a stem portion, a contact body portion, and a tip portion, with said stem portions and contact body portions of said outer fingers being disposed respectively beside and being of substantially the same length as said stem and contact body portions of said central finger,

(4) the side edges of said contact body portion of said central finger extending in substantial edge-to-edge contact with the adjacent side edge of each of the contact body portions of said outer fingers when the integral spring metal piece is in its normal undistorted condition,

(5) the side edges of said stem portions of said central finger being spaced apart from the adjacent side edge of each of the stem portions of said outer fingers, whereby said adjacent side edges cooperate to define elongated spaces between said stem portions,

(c) means integral with said base portion for securing said connector into a terminal block, said means comprising a shoulder portion containing an opening therein, said shoulder portion commencing at said base portion opposite said contact fingers and projecting therefrom and being narrower than said base portion,

whereby insertion of an electrical conductor between the contact body portion of one of said outer fingers and the contact body portion of said central finger causes said one outer finger and said central finger to be resiliently distorted away from each other, such distortion of said central finger then being opposed by the other of said outer fingers by reason of interengagement between the contact body portions of said central finger and said other outer finger.

4,084,878

CONNECTOR

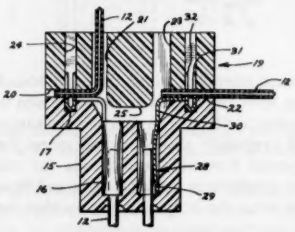
Chander Mohan Wahi, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Mar. 20, 1974, Ser. No. 452,689

The portion of the term of this patent subsequent to May 18, 1994, has been disclaimed.

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **2 Claims**



1. A solderless connector comprising in combination;

a base member having a top surface and including a plurality of contact receiving apertures disposed normal to said top surface;

contact means disposed in at least one of said apertures in said base, said contact means including a pair of upwardly extending legs adapted to conductively engage an electrical conductor, the legs on said contact means having inner opposed portions in parallelism prior to engagement with a conductor;

a cover member having a bottom surface and a like plurality of apertures and adapted to be removably disposed on said base with respective apertures in registration, the apertures in said cover being tapered so that the ends adjacent the bottom surface are larger than the ends remote from said bottom surface whereby assembly of said cover on said base causes the inner portions of the contact means to assume and retain a non-parallel disposition so that a conductor held therebetween is subjected to an increasing contact pressure as said cover is disposed on said base, and the cover member includes channel portions extending from the outer surfaces thereof to said apertures in which the channels extend between two non-parallel outer faces of the cover member.

4,084,879

FOIL TERMINAL BLOCK

Mark Norman Lepow, Santa Ana, Calif., assignor to American Security Equipment Company, Carson, Calif.

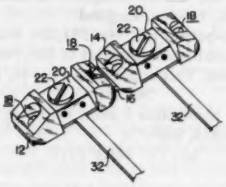
Filed Mar. 23, 1977, Ser. No. 780,477

Int. Cl.[2] H01R *9/18*

U.S. Cl. 339—198 GA **4 Claims**

1. A terminal block assembly for establishing electrical connections to an electrically conductive foil strip mounted on a pane of glass, said foil strip having an end with a hole therein, said assembly comprising: a base formed of molded plastic material and defining a pair of adjacent terminal blocks with a parting line therebetween to permit the blocks to be separated from one another, said base further defining a ramp for each of the terminal blocks sloping upwardly from the forward edge of the base, and said base defining a channel at the top of the ramp of each of the terminal blocks to receive the end of the foil strip; an electrically conductive bent-over clamping plate for

each of said terminal blocks separated from the base, so that the end of the foil strip may extend up the ramp and across the base under the clamp; and a screw for each of said terminal blocks



extending through the clamping plate and through the hole in the end of the foil strip into said base to mount the clamping plate on the base and extending over the corresponding ramp in clamping relationship with the end of the foil strip.

4,084,880

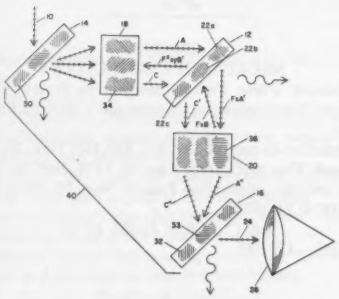
COHERENT OPTICAL COMPUTER FOR POLYNOMIAL EVALUATION

Richard G. Clow, 624 Black Canyon Stage, Phoenix, Ariz. 85020

Continuation-in-part of Ser. No. 543,173, Jan. 22, 1975, abandoned, which is a continuation of Ser. No. 398,332, Sep. 18, 1973, abandoned, which is a continuation of Ser. No. 117,784, Feb. 22, 1971, abandoned, which is a continuation of Ser. No. 720,262, Apr. 10, 1968, abandoned. This application Apr. 23, 1976, Ser. No. 679,552

Int. Cl.[2] G03H *1/26;* **G02F** *3/00;* **G06G** *9/00*

U.S. Cl. 350—3.72 **9 Claims**



1. A coherent optical computer comprising:

an input means having spatial variations in its optical properties, said spatial variations being of such physical dimensions as to cause incident optical beams to be substantially diffracted by the input means and in which input data are represented by the efficiencies of the action of the input means in causing diffraction of incident optical beams,

a mirror means for diffractively redirecting an optical beam diffracted by the input means so as to be diffracted again by the input means, and

a coefficient means which combines optical beams diffracted by the input means so that the combined beam has an amplitude proportional to a prescribed nonlinear polynomial function of the input data.

4,084,881

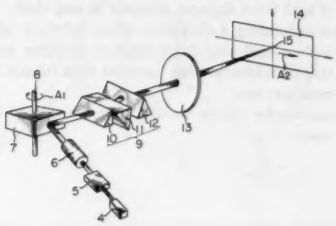
LIGHT BEAM SCANNING DEVICE

Yoichi Hirabayashi, Machida; Setsuo Minami, Yokohama, and Takeshi Goshima, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,408

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.8 **3 Claims**



1. A light beam scanning device comprising:

a source of light;

a deflecting mirror for causing a light beam from said source to be deflected about an axis toward which said light beam is directed;

a prism anamorphic afocal optical system for the correction of tilt disposed in the path of the deflected beam from said deflecting mirror, said prism anamorphic afocal optical system comprising a plurality of prisms so that different displacements of the deflected beam at each angle of deflection and in a direction perpendicular to the direction of deflection caused by the first of said prisms are corrected by the second and subsequent prisms, as viewed from the incidence side; and

a condensing optical system disposed between said prism anamorphic afocal system and a surface to be scanned, to thereby cause the deflected beam from said prism anamorphic afocal optical system to be condensed on said surface to be scanned.

4,084,882

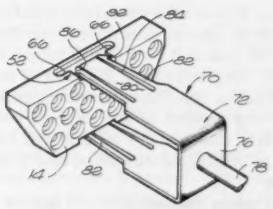
CONNECTOR MEMBER

Vaughan Clarence Hogan, Sun Valley, and Eleanor Anderson Landgreen, Temple City, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,906

Int. Cl.[2] G02B *5/14;* **H01R** *13/46*

U.S. Cl. 350—96.20 **8 Claims**



1. A connector member comprising:

a shell containing a rear fixed support member and a front support member slidably removable from the forward end of said shell;

each said support member having a forward face and a rear face;

a plurality of conductive elements mounted in said rear support member extending at least to said forward face

thereof but terminating behind said forward face of said front support member;

said shell having an inner surface;

said front support member having a forwardly facing shoulder thereon adjacent to said shell inner surface and behind said forward end of said shell;

said shell having at least one resilient retention finger extending inwardly and rearwardly from said inner surface thereof engaging said shoulder to limit forward movement of said front support member in said shell;

means defining a clearance space between said shell inner surface and said front support member extending from said shoulder to said forward face of said front support member; and

a rearwardly facing shoulder on the side of said clearance space.

4,084,883

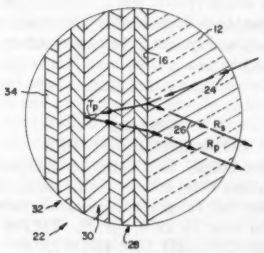
REFLECTIVE POLARIZATION RETARDER AND LASER APPARATUS UTILIZING SAME

Jay Morgan Eastman, and Stanley J. Refermat, both of Rochester, N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,384

Int. Cl.[2] G02B *5/30;* **H01S** *3/05*

U.S. Cl. 350—152 **9 Claims**



1. For use in laser apparatus having a body of laser material having faces on opposite sides thereof, and through one of said faces linearly polarized laser light is received and then transmitted after being reflected at the other of said faces, a transmissive-reflective polarization rotator disposed on said other face providing rotation of the plane of polarization of the reflected light such that the incident and reflected light are polarized in orthogonal directions, said polarization rotator comprising

polarizer means disposed upon said face for reflecting one of the *p* and *s* polarization components of said linearly polarized incident light and transmitting the other of said *p* and *s* polarization components thereof,

a reflector means for reflecting said other of said *p* and *s* components of said linearly polarized light, and

phase adjusting means sandwiched between said polarizing means and said reflecting means for adjusting the phase of said *p* and *s* components within said body such that said reflected light is polarized in a direction substantially orthogonal to the incident light.

4,084,884

LIQUID CRYSTAL DEVICES

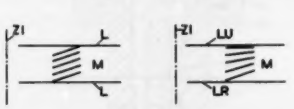
Edward Peter Raynes, Worcester, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 551,551, Feb. 21, 1975, abandoned, and a continuation-in-part of Ser. No. 552,346, Feb. 24, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,371

Claims priority, application United Kingdom, Feb. 21, 1974, 8042/74; Mar. 1, 1974, 9489/74

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—334 **20 Claims**



6. An optical display device comprising parallel walls defining a cell, a nematic liquid crystal material disposed between the cell walls, said liquid crystal material including at least some cholesteric type liquid crystal which confers to a uniform direction of twist upon the liquid crystal material between the cell wells, said cell walls having flat internal surfaces in contact with the liquid crystal material, and each said surface having a surface treatment such that substantially all the liquid crystal molecules in contact with the surface lie at the same angle to said surface, said angle being different for the two surfaces, and means for selectively applying an electrical potential difference between said internal surfaces of the cell walls such as to establish an electric field in the liquid crystal material such as substantially to align the liquid crystal molecules with said electric field.

4,084,885

MICROSCOPE OBJECTIVE

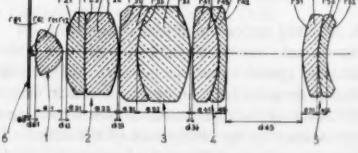
Pierre Coussot, Paris, France, assignor to Societe d'Optique, Precision Electronique et Mecanique - SOPELEM, Paris, France

Continuation-in-part of Ser. No. 527,155, Nov. 25, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,279

Claims priority, application France, Nov. 27, 1973, 73 42190; Oct. 28, 1974, 74 35933

Int. Cl.[2] G02B *21/02, 11/30*

U.S. Cl. 350—175 ML **2 Claims**



1. An objective for a microscope of focal length f and provided with a lens to form an image in the focal lens of the ocular comprising a lens of positive power located at the front-end of the objective, close to the object, having the form of a meniscus the concave face of which is directed toward the object, a lens of negative power situated at the rear extremity of the objective having a convex surface directed toward the

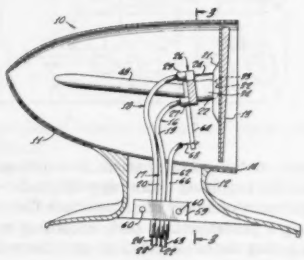
object, three intermediate doublets of positive power formed each of a convergent lens cemented to a divergent lens, the mensicus lens (1) at the front having a focal length between 1.5f and 2.5f the lens of negative power (5) being a doublet formed of a convergent lens (51) cemented to a divergent lens (52) for which the indices are very similar and for which the partial dispersions are quite different, the focal length of said doublet being between −8f and −15f, the first doublet (41–42) situated close to the lens of negative power being formed of glasses of very different indices, having a focal length between 14f and 18f, and is located at a distance of substantially 1.9f from the lens of negative power, the second doublet (31–32) located immediately in front of the first doublet being formed of glasses of very different indices and having almost identical partial dispersions, having a focal length between 6f and 8f, and located at a distance of substantially 0.04f from the first doublet, the third doublet (21–22) situated between the second doublet and the mensicus lens situated at the front end being formed of glass of high indices, having a focal length between 3f and 4f and located at a distance of substantially 0.04f from the second doublet and at a distance between 0 and 0.2f from the meniscus lens.

4,084,886

DAY/NIGHT OUTSIDE MIRROR FOR VEHICLES

Steven Wayne Grosch, 4931 Carthage, and Michael John Stack, 1730 Santee River, both of Placentia, Calif. 92670

Filed Apr. 21, 1976, Ser. No. 678,871
Int. Cl.² G02B *17/00*
U.S. Cl. 350—281 **11 Claims**



1. A day/night mirror assembly for the exterior of a vehicle comprising
a prismoidal mirror,
a body adapted for attachment to the exterior of a vehicle,
a support rotatably supporting said mirror, means rotatably connecting said support to said body,
and means for adjusting the position of said mirror relative to said body, said adjusting means including,
at least one outer cable element engaging said support and resiliently biasing the same in one direction,
and means for moving said support in the opposite direction in opposition to said resilient biasing.

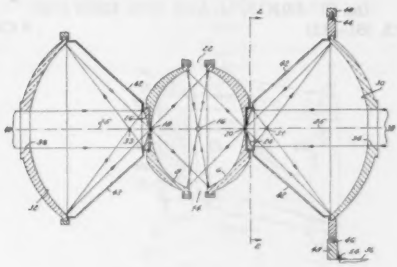
4,084,887

ALL-REFLECTIVE OPTICAL TARGET ILLUMINATION SYSTEM WITH HIGH NUMERICAL APERTURE

Robert D. Sigler, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed May 7, 1976, Ser. No. 684,094
Int. Cl.² G02B *5/10*
U.S. Cl. 350—294 **7 Claims**

1. In an optical system for providing illumination of a target region at high numerical aperture from a pair of collimated beams of electromagnetic energy co-axially confluent on a system axis, and comprising a pair of opposed first ellipsoidal reflectors disposed to define a target cavity about said target region and having respective openings on said system axis, the improvement comprising means providing spherical reflective surfaces respectively disposed and directed outwardly of said target cavity having first openings on said system axis, and means providing conic section reflective surfaces disposed and directed oppositely of respective spherical reflective surfaces and having second openings on said system axis, collimated



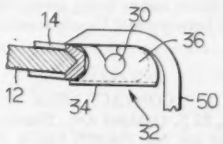
beams traveling on said axis being incident upon respective ones of said spherical reflective surfaces through said second openings, reflected onto said conic section reflective surfaces and then focused into said target cavity through said first openings.

4,084,888

PROTECTIVE COVER FOR SPECTACLE JOINT

Yoji Miyamoto, 12-24 Nishi-Yamamoto-Cho, 4-Chome, Yao-shi, Osaka, Japan

Filed Sep. 2, 1976, Ser. No. 719,746
Int. Cl.² G02C *1/08*
U.S. Cl. 351—97 **8 Claims**

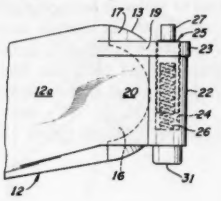


1. A protective cover for a spectacle frame of the type having a split rim and first and second opposed connection lugs on respective ends of said split rim and a fastening means having a head end and a tail end for extending into and through said first and second lugs to hold said lugs together at a lug joint between said lugs to thereby hold said rim together around a lens, said fastener having the tail end thereof extending out of one of said lugs, said cover comprising:
a member having a generally U-shaped cross section so as to have a back section and first and second legs thereof, said U-shaped member being sized to fit over said lugs so that one of said legs covers a side of one lug and the other of said legs covers a side of the other lug while the back section extends across both of said lugs and said lug joint;
means defining a hole in said first leg for location around the tail end of said fastener; and
an opening between an edge of said first leg and said means defining said hole so that said first leg is slidable over said tail end of said fastener while the other of said legs covers the head end of said fastener.

4,084,889
EYEGLASS FRAME

Alfred Vischer, Jr., deceased, late of Golden, Colo. (by Peter Vischer, executor), assignor to Vischer Optics, Inc., Golden, Colo.

Filed Jul. 28, 1976, Ser. No. 709,497
Int. Cl.² G02C *5/14, 5/22, 5/16;* E05D *9/00*
U.S. Cl. 351—121 **8 Claims**



1. An opthalmic mounting, comprising
a lens frame having a rearwardly facing shoulder at one side edge thereof,
a temple member having a forwardly facing outer end surface complimentary to said shoulder and abutting said shoulder when said temple member is in an open position,
a forwardly extending hinge portion integral with said temple member,
said hinge portion having a partial cylindrical surface at the distal end thereof,
said lens frame having a rearwardly opening socket adjacent to said shoulder,
said socket having a wall portion which is partially cylindrical and complimentary to said cylindrical surface on said temple member,
a pair of aligned holes in said frame coaxial with the axis of generation of said cylindrical wall portions of said socket,
a first pivot member extending from one end of said cylindrical surface into one of said holes, and
an axially movable second pivot means extending into the other of said holes and into an axial hole in said cylindrical surface for removably mounting said temple member to said frame,
said movable pivot means being spring biases into locking relationship between said temple member and said frame.

4,084,890
CONTACT LENS

Henry J. Baron, 52 S. Oakland Ave., Sharon, Pa. 16146

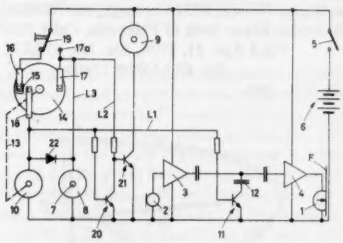
Continuation of Ser. No. 278,067, Aug. 4, 1972, abandoned, which is a continuation of Ser. No. 888,293, Dec. 29, 1969, Pat. No. 3,698,802, which is a continuation-in-part of Ser. No. 687,240, Dec. 1, 1967, abandoned, and a continuation-in-part of Ser. No. 736,124, Jun. 11, 1968, abandoned, and a continuation-in-part of Ser. No. 736,149, Jun. 11, 1968, abandoned. This application May 7, 1975, Ser. No. 575,139
The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.
Int. Cl.² G02C *7/04*
U.S. Cl. 351—160 **6 Claims**

1. A contact lens adapted to be positioned adjacent the cornea while at the same time maintaining good visual acuity, said lens being formed from a transparent, soft, flexible, hydrophilic, cross-linked polymeric material and having an outer surface and a concave inner surface that conforms generally to that surface of the cornea adjacent to which it is located, said lens having a centrally located optical zone and a peripheral portion extending outwardly from said optical zone and terminating in a relatively thin edge of the lens, the juncture of said optical zone and said peripheral portion being defined by a visually apparent change in the shape of said outer surface of said optical zone at said juncture, said peripheral portion having a region intermediate said edge and said juncture, said region being thicker than at said edge or said juncture.

4,084,891
SOUND MOTION-PICTURE CAMERA

Hans-Friedrich Kiefer, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 9, 1976, Ser. No. 694,194
Claims priority, application Germany, Jul. 5, 1975, 2530134
Int. Cl.² G03B *31/00*
U.S. Cl. 352—22 **9 Claims**



1. In a sound motion-picture camera, in combination, current source means for supplying operating voltage; drive means for effecting transport of sound motion-picture film through the camera along a predetermined path; recording means operative for recording audio information onto the sound track of the motion-picture film, the recording means including circuit means forming a transmission path for audio-information signals, connecting means connecting the current source means to the circuit means for applying to the latter operating voltage enabling the circuit means for transmission of audio-information signals through the transmission path, and controllable attenuating means connected in the transmission path and operative when activated for preventing recording of sound despite the enablement of the circuit means for transmission by attenuating the transmission of audio-information signals through the transmission path; and control means automatically operative for activating the attenuating means for a predetermined time interval both when the drive means is being started up at the start of the filming of a scene and also when the drive means is being stopped at the end of the filming of a scene.

4,084,892
FILM ADVANCEMENT CONTROL FOR MOTION PICTURE PROJECTOR

John P. Bagby, Lake Forest; Erwin E. Figge, Des Plaines, and Raymond W. H. Kim, Skokie, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 769,987
Int. Cl.² G03B *31/02, 21/48*
U.S. Cl. 352—29 **16 Claims**

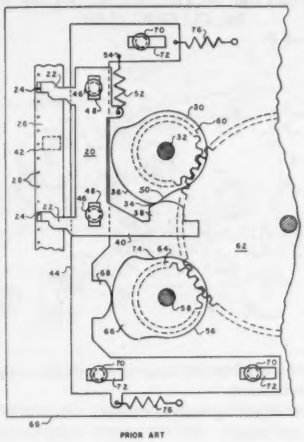
1. In a film projector having a shuttle tooth moveable into and out of engagement with perforations in the film and adapted to be reciprocated in the direction of film feed for

intermittently advancing the engaged film along a path between a light source and a projection aperture, a control for varying the speed of film advancement, comprising;

a rotary shutter assembly having at least one shutter blade for interrupting the light from the light source;

a rotary cam having a number of cam lobes equal to the number of shutter blades, said cam lobes being mechanically coupled to the shuttle tooth for reciprocating the shuttle tooth in the direction of film feed once for each revolution of a cam lobe,

the rotation of each of said cam lobes being synchronized to the rotation of the corresponding shutter blade such that the shuttle tooth is positioned for engagement with the perforations associated with the next successive film frame



PRIOR ART

to be projected whenever a shutter blade interrupts the light source;

means responsive to the interruption of the light by each shutter blade for generating a train of electrical pulses equal in number to 1/Nth the number of light source interruptions, where N is an integer;

means responsive to each pulse for advancing the shuttle tooth into engagement with the perforations in the film upon receipt of each pulse in the train of pulses,

whereby the shuttle tooth is reciprocated in the direction of film feed once for each revolution of a cam lobe but the film perforations are engaged by the shuttle tooth only on every Nth shuttle tooth reciprocation so that the rate of film advance can be selectably varied by varying the value of N.

4,084,893

EXPOSURE CONTROL FOR MOTION PICTURE CAMERAS

Robert Flandorfer, Frankfurt am Main, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

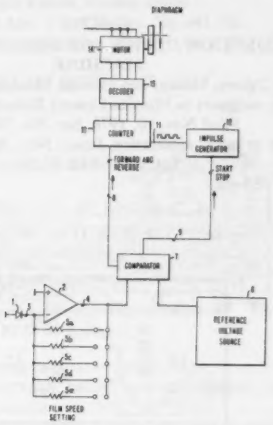
Filed Apr. 22, 1976, Ser. No. 679,238

Claims priority, application Germany, Apr. 26, 1975, 2518675

Int. Cl.² G03B *7/08*

U.S. Cl. 352—141 **4 Claims**

1. An electronic exposure control circuit for motion picture cameras, comprising a photosensitive element, an amplifier connected thereto, a stepping motor for step-wise setting the diaphragm of said camera, a reference voltage source, a voltage comparator having a pair of input terminals, one of said terminals being connected to the output of said amplifier, and the other of said inputs receiving said reference voltage, said comparator having logic outputs responsive of the polarity and of the magnitude of the voltage difference at the inputs, respectively, further comprising a bi-directional counter having an input for setting the counter into the forward or reverse mode of counting, which input is coupled to the output of the comparator which is responsive to the polarity, a clock generator, the output of which is coupled to the input of said counter and a start-stop input of the clock generator being coupled to that



logic output of the comparator which is responsive to the magnitude, and a decoder interposed between the outputs of said counter and the stepping motor.

4,084,894

ARRAY OF OPTICAL PROJECTION DEVICES

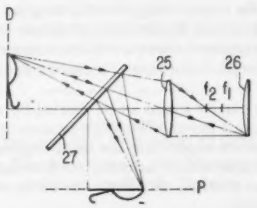
Masaki Yoshino, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,796

Claims priority, application Japan, Mar. 24, 1973, 48-33097

Int. Cl.² G03B *21/26;* **G02B** *27/00, 17/00*

U.S. Cl. 353—34 **3 Claims**



1. An array of optical image projection devices where each image projection device projects a portion of an object image onto a surface to form the entire object image on the surface without overlapping of the image portions where each image projection device consists of

a double convex lens for projecting its corresponding portion of the object image;

a reflecting focusing means for reflectively focusing the image portion projected by said lens back through said lens; and

further reflecting means for projecting the image portion projected back through said lens onto said surface so that all of the image portions may be merged into a single image on the surface, said further reflecting means comprises a semi-transparent reflector angularly disposed with respect to the optical axis of said double convex lens between said double convex lens and said object image so that the light rays pass from said object through said semi-transparent reflector and double convex lens to said refractive reflecting means where an inverted, actual image of said object is formed, said light rays being re-

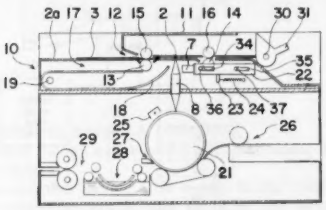
flected back through said lens and again reflected from said semi-transparent reflector onto said surface where a regular, actual image of said object is formed.

4,084,895

PROJECTION DEVICE FOR A PHOTOCOPYING MACHINE

Masaya Ogawa, Osaka, and Hiroshi Murasaki, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Nov. 10, 1976, Ser. No. 740,722
Claims priority, application Japan, Nov. 28, 1975, 50-143231
Int. Cl.[2] G03B *27/00*
U.S. Cl. 355—1 **10 Claims**



1. In a photocopying machine which permits reproduction both of thick original documents and of thin original documents, wherein a thin original document is transported past an exposure station by a transport means during the photocopying process, and a thick original document is supported on a transparent carrier means and carried along a line parallel to the plane of the exposure station during the photocopying process, the thick original document being separated from the exposure station by a distance equal to the thickness of the carrier means, a projection device comprising:

an exposure station;

a transport means including a pair of roll means provided at both sides of said exposure station for transporting the thin original document, and a guide means provided to form a passage for transporting the thin original documents facing said exposure station and roll means, said guide means being arranged to move away from said exposure station during the photocopying process of a thick original document;

a transport carrier means to be carried by said pair of roll means during the photocopying process of a thick original document for supporting the thick original document;

an illumination means actuable to illuminate the original document portions brought to or in line with said exposure station;

a focussing means provided to direct the image-wise light from said original document portions illuminated by said illumination means onto the outer surface of the photosensitive means of the photocopying machine which is able to form a latent image of the original documents upon being struck by the image-wise light coming from the original document portions;

a transparent block having a thickness T obtained by the following formula

$$T = \frac{n2}{n1(n2 - 1)} \cdot t$$

wherein t is the thickness of said transparent carrier means, and $n1$ and $n2$ are the refractive indexes of said transparent carrier means and transparent block, respectively, said transparent block being movable to an interposed position between said focussing means and said exposure station during the photocopying process of a thick original document in order to compensate for the deviation of the image-wise light caused by said transparent carrier means; and

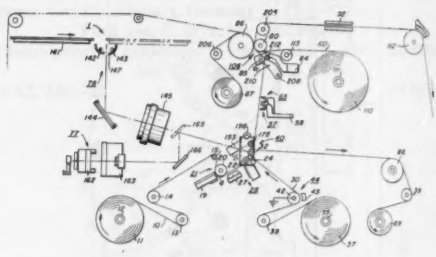
an operating means actuable to bring said transparent block into the interposed position in connection with the operation of switching the photocopying process from the thin original document to the thick original document.

4,084,896

PHOTOELECTROPHORETIC WEB IMAGING APPARATUS

Peter J. Warter, Jr., Penfield; Gino F. Squassoni, Pittsford; Vsevolod Tulagin, Rochester; Roger G. Teumer, Fairport, and Raymond K. Egnaczak, E. Williamson, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,336
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 P **12 Claims**



1. A photoelectrophoretic imaging apparatus comprising, in sequential combination,

a transparent injecting web electrode;

a blocking electrode;

means for supporting and advancing the injecting web electrode and blocking web electrode along predetermined paths into registration at or before a common imaging station and apart thereafter;

ink coating means arranged for applying a film of photoelectrophoretic ink to at least part of the inside face of the injecting web electrode before registration with the blocking web electrode;

precharging means for effecting dark deposition of pigment or dye ink components preapplied to the injecting web electrode before registration with the blocking web electrode;

an imaging station and curved backup support for the blocking web electrode while in register with the ink coated injecting web electrode;

means for image-wise exposing at least the injecting web electrode and deposited ink while in register with the blocking electrode at the imaging station;

means for simultaneously establishing and maintaining an electric field across the registered webs and applied ink at the imaging station during exposure;

means for guiding, supporting and advancing an image transfer web into temporary registration with the injecting web at a combined image transfer and fixing zone, the advancing injecting web having at least one photoelectrophoretic image thereon;

an image transfer roller in guiding contact with the transfer web in the combined image transfer and fixing zone;

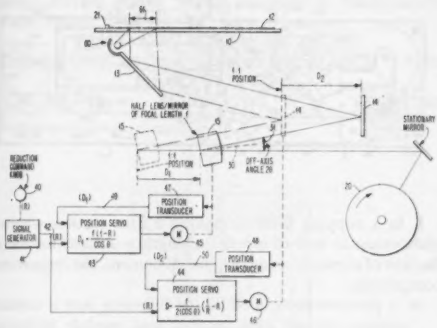
a pressure roller arranged in general opposition to the image transfer roller and equipped with heating means, said pressure roller being movably biased against the non-image-bearing side of the injecting web in the combined transfer and fixing zone;

whereby image transfer and fixing steps are simultaneously effected against the transfer web while in register with the injecting web.

4,084,897
HALF-LENS/MIRROR COPIER PROVIDING ORIGINAL-TO-COPY IMAGE REDUCTION

Carl Allan Queener, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,808
Int. Cl.[2] G03G *15/28*
U.S. Cl. 355—8 7 Claims



4. A continuously variable reduction imaging system for an electrophotographic copier machine, wherein a document to be copied is typically of rectangular shape, comprising:

a transparent platen for supporting said document;

a constant speed movable photoconductor;

motive means for moving said photoconductor;

a source of illumination;

a document scanning system comprised of a scanning carriage for directing illumination from said source through said platen to said document;

means for moving said scanning carriage;

an optics system for directing illumination reflected from said document to produce an image on said photoconductor, said optics system including in sequential order from said document to said photoconductor, a scanning mirror and motive means to move said mirror, and a half-lens/-mirror; and

means for positioning said optic system to initialize said optics system for a desired reduction ratio, wherein said mirror and said half-lens/mirror are adjusted in a continuously variable manner;

whereby the reduction ratio of said imaging system is settable in a continuously variable manner;

said means for positioning said optics system being constructed and arranged

(1) to effect movement of said half-lens/mirror along the axis of the reflected image of said document, in a direction toward said photoconductor, in accordance with the formula $f(1-R)/\cos\theta$, where f is the focal length of said half-lens/mirror, R is the desired reduction ratio, and the angle θ is one-half of the off-axis angle of said half-lens/-mirror; and

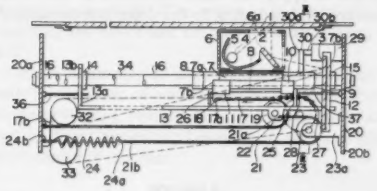
(2) to effect movement of said scanning mirror along the axis of the light reflected from said document, in a direction away from said document, in accordance with the formula:

$f/2\cos\theta(1/R-R)$.

4,084,898
PHOTOCOPYING APPARATUS MIRROR DRIVE MEANS

Takaji Kurita, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 17, 1974, Ser. No. 461,786
Claims priority, application Japan, Apr. 24, 1973, 48-48881[U]
Int. Cl.[2] G03G *15/28, 15/32*
U.S. Cl. 355—8 7 Claims



1. A photocopying apparatus comprising:

a horizontally movable optical assembly slidably supported by a support means;

a projecting lever member fixedly attached to said support means;

an endless drive means having a pin member attached thereto;

said endless drive means being rotated by a plurality of wheel means;

said pin member, upon initiation of drive of said endless drive means, being located at a position on one of said wheel means where the horizontal component of velocity thereof is substantially zero;

said pin member contacting said lever member to move said optical assembly;

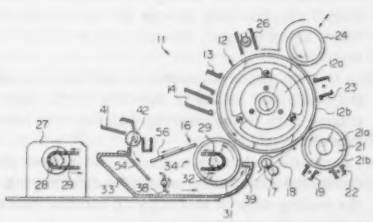
said pin member and said lever member being positioned such that the initial contact therebetween is at a position at which the horizontal component of velocity of said pin member is substantially zero; and

means for releasing the contact of said pin member with said lever member and to allow return of said optical assembly to a starting position.

4,084,899
ELECTROSTATIC COPYING MACHINE

Tsutomu Ishida; Masaaki Nomura, and Wasaburo Ohta, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,830
Claims priority, application Japan, Apr. 14, 1976, 51-42084
Int. Cl.[2] G03G *15/22*
U.S. Cl. 355—14 4 Claims



1. An electrostatic copying machine comprising:

a rotary photoconductive drum;

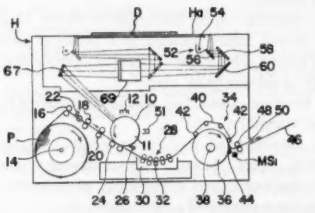
exposure means for forming an electrostatic image on the drum;

developing means for applying a toner substance to the drum to develop the electrostatic image and form toner images;
transfer means for transferring the toner images to respective copy sheets;
drum drive means for rotating the drum at a first speed for exposure and development of said electrostatic image to form a first toner image and at a second speed which is higher than the first speed for development of said electrostatic image to form subsequent toner images; and,
development control means for controlling the developing means to apply the toner substance to the drum in an amount corresponding to the drum rotational speed.

4,084,900
JAM DETECTING DEVICE IN THE ELECTROPHOTOGRAPHIC COPYING MACHINE

Sadao Yamaoka, and Kenichi Arai, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Dec. 6, 1976, Ser. No. 747,686
Claims priority, application Japan, Dec. 12, 1975, 50-148926
Int. Cl.[2] G03G *15/00;* B65H *7/04*
U.S. Cl. 355—14 12 Claims



1. In an electrophotographic copying machine for forming a pattern of an original to be copied on sheets of copying material of various sizes moved along a path having various processing stations therealong, a jam detecting device for detecting a copy material jam occurring between a first position and a second position along said path, said second position being adjacent the vicinity of the position along said path at which the copying material is discharged from the machine, and said first position being spaced along said path ahead of said second position with at least processing stations for image formation on the copying material and for fixing the image on the copying material being between said first and second positions, said jam detecting device comprising:

(a) a timer means for setting a period of a predetermined length which is long enough for the copying material to travel along the path between said first and second positions;

(b) a starting means connected to said timer means for starting said timer means at the time of the passing of the trailing edge of the copying material over said first position along said path;

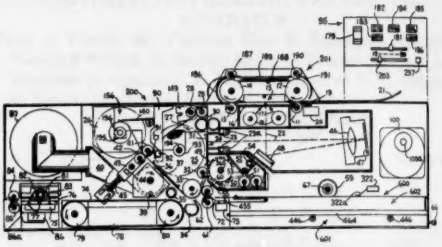
(c) a material detecting means at said second position and connected to said timer means for detecting the passing of the trailing edge of said copying material past the second position along said path; and

(d) means connected to said timer means for producing a signal in the event that said material detecting means does not detect the trailing edge of the copying material within said predetermined length of time, which signal is indicative of a copy material jam occurring along said path.

4,084,901
COPYING MACHINE

Torulf F. Aasen, Hollywood, Fla.; Jules Nisenson, Southbury, and Charles E. Pegg, Danbury, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 25, 1976, Ser. No. 670,253
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—16 31 Claims



1. In a copying machine having a base section wherein a photoreceptor web of indefinite length is utilized for the production of copies from an original document, the improvement comprising:

A. a photoreceptor module for insertion into a stationary position in said base section, said module including a supply reel and a take-up reel, each rotatably mounted on said module, said photoreceptor web normally being wound on said supply reel and moved to said take-up reel during successive copying operations of the copying machine, and

B. means formed in said base section

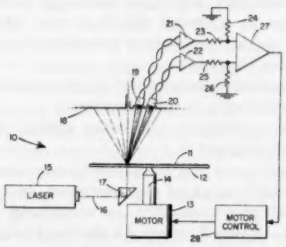
(i) for removably receiving said module therein through a top portion of said base section whereby said module may be easily removed from said base section and another module substituted therefor, and

(ii) for holding said module in a stationary position in said base section.

4,084,902
METHOD AND APPARATUS FOR PRODUCING A SUSPENSION OF BIOLOGICAL CELLS ON A SUBSTRATE

James Edmond Green, P.O. Box 734, Fayetteville, Tenn. 37334

Filed Jul. 26, 1976, Ser. No. 708,878
Int. Cl.[2] G01N *1/10*
U.S. Cl. 356—38 36 Claims



1. A method for producing a desired cell density in a suspension of biological cells on a substrate, said method comprising the steps of:

(1) forming by electro-magnetic energy incident upon said cell suspension a cell modified pattern of electro-magnetic energy with respect to the axis of the incident electromagnetic energy;

(2) detecting electro-magnetic energy levels at at least one off-axis location in said cell modified electro-magnetic energized pattern; and

(3) reducing the cell density of said suspension of biological cells until a predetermined energy level is detected at said at least one off-axis location, said detected energy level being referenced to a preselected, constant energy level which is independent of the cell density of the suspension.

4,084,903

HIGH-PRECISION MASK PHOTOREPEATER

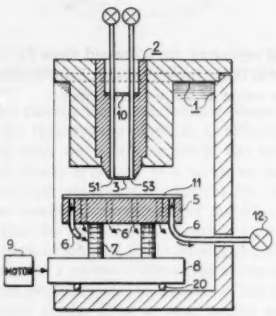
Georges Pircher, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 26, 1976, Ser. No. 735,890

Claims priority, application France, Oct. 31, 1975, 75 33464

Int. Cl.[2] G03B *27/42*

U.S. Cl. 355—53 **5 Claims**



1. A mask photorepeater apparatus comprising a light source for radiating a light beam, and upon said light beam trajectory, a mask, an optical system, a table having means for carrying a sample holder, said system being adapted for forming of said mask, upon said sample, an image with a magnification factor substantially lower than 1, motor means for displacing said table, and computer means, for controlling said motor means according a predetermined program, said carrying means comprising at least three piezoelectric bars having respective electric control inputs, pneumatic sensors tied to said optical system, for sensing the distance between said sample and the front of said optical means, and for delivering control signals to said inputs of said bars.

4,084,904

OPTICAL COPYING APPARATUS

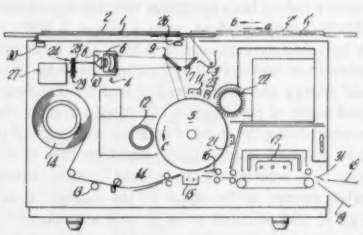
Hiroshi Ikeda, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1976, Ser. No. 705,744

Claims priority, application Japan, Aug. 1, 1975, 50-94496

Int. Cl.[2] G03B *27/70;* **G03G** *15/28*

U.S. Cl. 355—66 **9 Claims**



1. In an optical copying apparatus having an original carrying support or an original-image scanning mirror for scanning successively the surface of an original by reciprocation, a projecting optical system including an objective lens, and a photosensitive member movable in a given direction on which an original image is focused through said optical system, wherein said optical system comprises:

(a) a single objective lens;

(b) a single roof reflecting member positioned in the rear of said objective lens and having adjoining reflecting surfaces making a right angle therebetween and turnable through an angle of 90° in response to the advancing and returning travels of said support or said scanning mirror; and

(c) a single semireflector member positioned in the optical path in the front of said objective lens and oriented to direct projecting beams from said original onto said lens and to direct projecting beams from said lens onto said photosensitive member.

4,084,905

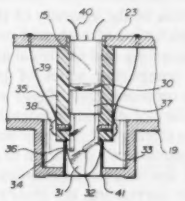
APPARATUS FOR DETECTING AND MEASURING FLUORESCENCE EMISSION

Ulrich Schreiber, Burnaby, and William Vidaver, W. Vancouver, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Mar. 11, 1976, Ser. No. 666,170

Int. Cl.[2] G01J *3/30, 3/48*

U.S. Cl. 356—85 **1 Claim**



1. Apparatus for measuring light induced changes of chorophyll fluorescence yield i.e. the Kautsky effect in living plant samples comprising:

(a) a fluorometer probe comprising:

(1) a housing having a transparent window,

(2) a light emitting diode mounted in an epoxy dome lens positioned inside the housing adjacent the said window for illuminating the plant sample through the window,

(3) a phototransistor operating in the photovoltaic mode for detecting and measuring fluorescence emission received through the window from the plant sample on illumination mounted inside the housing in piggy-back relation to the said light emitting diode such that fluorescence emission from the plant sample passing through the window is collected and guided by the epoxy lens to the phototransistor,

(4) an optical filter mounted between the window and the phototransistor,

(5) a preamplifier adjacent and connected to the phototransistor,

(b) timing and control means connected to the probe via an extended electrical lead cable comprising:

(1) a timing circuit connected to the light emitting diode for controlling its on-off times,

(2) an amplifier and electrical filter connected to the preamplifier,

(c) output recording means connected to the said amplifier.

4,084,906

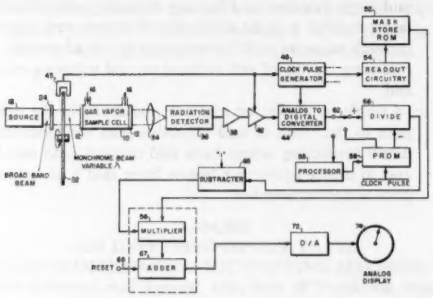
MULTIGAS DIGITAL CORRELATION SPECTROMETER

Robert J. Bibbero, Merion Station, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 547,706, Feb. 6, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,957

Int. Cl.[2] G01J *3/42, 3/48*

U.S. Cl. 356—96 1 Claim



1. A spectrometer for monitoring a gaseous mixture in order to detect a component gas of interest in said mixture, comprising in combination:

a source of monochromatic radiation disposed to irradiate said mixture;

means for periodically sweeping said source through a predetermined spectrum of frequencies;

means disposed to receive the radiation emerging from said mixture and produce an electrical analogue signal which is a function of the intensity of the radiation received;

means synchronized with said periodically sweeping means for converting said electrical analogue signal to an output signal comprising series of binary numerical electrical signals representative of said analogue electrical signal to a plurality of discrete predetermined wavelengths;

means for storing a plurality of binary numbers whose values are a function of a spectrum of a component gas of interest at said discrete, predetermined wavelengths; and

means for correlating the binary output signal of said converting means with the binary numbers in said storage means including means to divide the output of said converting means by a series of binary numbers whose values are a function of the values of the output of the converter means at said predetermined wavelengths for a predetermined absorption by a gas mixture and means for subtracting the output of said divider means from one, means for multiplying the output of said subtracter means with the numbers stored in said storage means, and means for summing the output of said multiplier means.

4,084,907

METHOD AND APPARATUS FOR DETERMINING THE WAVE NUMBER OF OPTICAL SPECTRUM RADIATION

Jacques Andre Pinard, Buc, and Patrick Pierre Paul Juncar, Evry, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

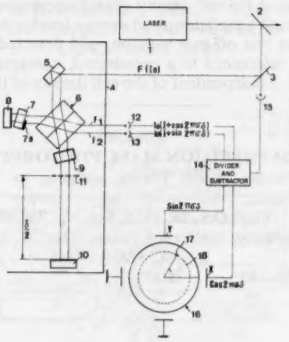
Filed Nov. 7, 1975, Ser. No. 630,028

Claims priority, application France, Nov. 14, 1974, 74 37583

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—106 S 14 Claims

1. A method of determining the wave number of optical spectrum radiation of a beam provided by a source of radiation to be monitored including directing two parts of said beam to two double-wave interferometers, comprising the steps of assigning optical path length differences δ of said interferometers a difference value of $\lambda/4$ which corresponds to a phase difference of $\pi/2$, converting two output optical signals emerging from said interferometers into electrical sinusoidal signals in quadrature as a function of the wave number $\sigma = 1/\lambda$ of said source of radiation and δ, processing the two sinusoidal signals so as to obtain a modulo value $1/\delta$ of the wave



number, and repeating the aforesaid steps for different values of δ in order to come progressively closer to eliminating uncertainty in the value of the wave number.

4,084,908

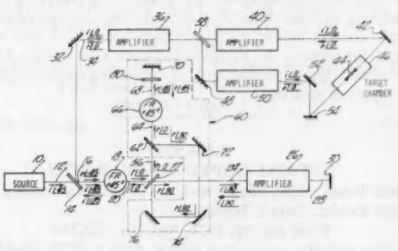
REPETITIVE OUTPUT LASER SYSTEM AND METHOD USING TARGET REFLECTIVITY

Roy R. Johnson, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Nov. 10, 1975, Ser. No. 630,616

Int. Cl.[2] G02F *1/09;* G01B *1/00;* H01S *3/00*

U.S. Cl. 350—151 12 Claims

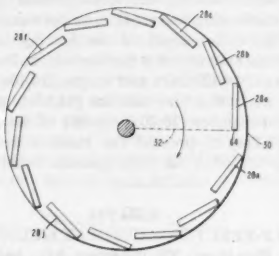


1. In the method of providing successive target illumination pulses in a pulsed laser system in which a significant portion of the laser energy incident upon a target is reflected thereby back into said system, and in which said reflected energy is diverted from said system by rotating the angle of polarization of said energy and then diverting said reflected energy at said rotated angle of polarization out of said system, the improvement comprising the steps of rotating said angle of polarization of said diverted energy to be equal to that of said incident energy at a selected point in said system, attenuating said diverted energy to be equal to the energy of said incident energy at said selected point in said system, and redirecting said rotated and attenuated energy to said selected point in said system, whereby successive target illumination pulses are directed onto a target as a result of target reflectivity.

4,084,909
DRUM MONOCHROMATOR

Einar Skau Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,982
Int. Cl.[2] G01J 3/48
U.S. Cl. 356—188 6 Claims

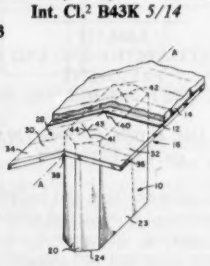


1. In a monochromator, a combination comprising:
a light source;
a series of flat narrow band interference filters, each filter designed for transmitting light at a different nominal wavelength with the whole series of flat narrow band interference filters arranged in a circle in order of decreasing nominal wavelength adjacent the light source for relative rotational movement of the filters and light source so that the light source transmits light radially of the circle, each of said flat filters having one side which is perpendicular to a radius of the circle at one edge of the filter and not perpendicular to a radius of the circle at the opposite edge of the filter so that during said relative rotation movement the light transmitted through each of the filters varies in a range extending substantially from the nominal wavelength when the light is being transmitted through the filter at said one end to some value lower than the nominal wavelength as light is being transmitted through the filters at said other edge;
Light receptor means mounted on the opposite sides of said filters from said light source means for receiving light transmitted through said filters; and,
Means for effecting relative rotation between said filters and said light source means and said receptor means so that light passes through the filters in order of nominal wavelength whereby the nominal wavelength of light passing through each filter changes as the light directed thereon changes its position on the filter and the nominal wavelength of transmission changes substantially continuously across the spectrum covered by the series of narrow band interference filters as the light passes from filter to filter in the series.

4,084,910
DISPOSABLE SELF-CONTAINED LIQUID APPLICATOR

John LaRosa, New Milford, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Jul. 13, 1976, Ser. No. 704,776
Int. Cl.[2] B43K 5/14
U.S. Cl. 401—133 15 Claims

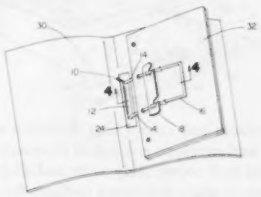


1. A disposable self-contained liquid applicator comprising:
a container for liquids;
a rupturable membrane for sealing said container;
absorbent applicator means overlying said membrane for receiving liquid from said container when said membrane is ruptured; and
means underlying said membrane for producing a rupturing surface and for penetrating said membrane upon actuation by a force applied to the outside of the applicator said latter means being formed of a single piece of material and including a member having two planar sections intersecting to define a bending line and at least one serrated slit formed in said member along said bending line under said membrane, and wherein said slit has teeth-like edges in the plane of at least one of said planar sections for forming the rupturing surface and penetrating said membrane, said edges being moved outwardly against said membrane upon actuation of said means for producing a rupturing surface and for penetrating said membrane, wherein said planar sections have outer flange portions extending away from said container, said flange portions being manually moved downwardly and inwardly toward said container for producing said teeth-like edges from the sections of said member and for moving said edges outwardly against said membrane.

4,084,911
FLEXIBLE PAPER FASTENER

David A. DeWitt, Tewksbury, Mass., assignor to Ames Safety Envelope Company, Somerville, Mass.

Continuation-in-part of Ser. No. 675,743, Apr. 12, 1976, abandoned. This application Jan. 26, 1977, Ser. No. 762,653
Int. Cl.[2] B42F 13/04, 13/10
U.S. Cl. 402—15 2 Claims



1. A fastener for securing perforated sheets of paper to a base such as a file folder comprising an elongated flexible thermoplastic tubular member having opposite end portions arranged to extend through spaced apart perforations in said sheets and a flattened intermediate portion for attachment to said base, a stiff generally U-shaped bridge member having its ends spaced apart by a distance approximately equal to the length of said flattened intermediate portion of the tubular member and arranged to engage releasably with opposite ends of said tubular member to maintain them spaced apart, and a stiff keeper having a pair of friction locks spaced apart by a distance approximately equal to the spacing between said ends of said bridge member, said locks being arranged to engage releasably opposite portions of said flexible tubular member,
wherein the improvement comprises a flexible resilient laminated plastic sheet having a length at least 20% longer than the length of said flattened intermediate portion of said tubular member, and having an upper facing layer thereof heat sealed to said flattened intermediate portion throughout its length, and having on its opposite face extending throughout its area a layer of pressure sensitive adhesive for adhering said sheet to said base, and a temporary protective cover sheet at the bottom exposed surface of said pressure sensitive adhesive layer, said tubular member and the upper facing layer of said laminated sheet both being vinyl resin and having softening temperatures within 5° C of each other, and said laminated sheet having an intermediate polyester reinforcing layer between said upper facing layer and said pressure sensitive adhesive layer, said intermediate polyester reinforcing layer having

a softening temperature of at least 150° and more than 40° C above the softening temperature of said upper facing layer.

4,084,912

METHOD AND ASSEMBLY FOR SEALING GAPS BETWEEN ADJACENT ROADWAY SLABS

Lawrence F. Pyle, Des Plaines, and John F. Brady, Wood Dale, both of Ill., assignors to Fel: Products Mfg. Co., Skokie, Ill.

Filed Jul. 19, 1976, Ser. No. 706,691
Int. Cl.[2] E01C *11/02*
U.S. Cl. 404—74 **6 Claims**

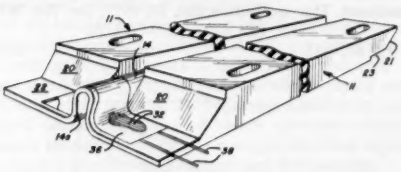
1. A roadway joint sealing assembly for providing a sealed joint between a pair of elongate adjacent roadway slabs which are spaced from each other to define a gap therebetween, comprising:

a first elongated gap sealing member spanning said gap and anchored to said slabs and having a first elastomeric confronting end surface;

a second elongated gap sealing member spanning said gap and anchored to said slabs and having a second elastomeric confronting end surface having a configuration generally complementing the shape of said first confronting end surface for mating and abutting confrontation therewith;

heat activatable bonding agent comprising an envelope of vulcanizable rubber-like material spanning said gap and disposed between said first and second confronting surfaces; and

expansive heating means secured to one of said confronting



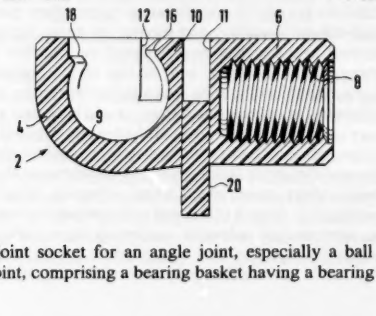
end surfaces and comprising electrical conductor means within said envelope positioned to remain in situ, spanning said gap and cooperating with and disposed adjacent at least one of said confronting surfaces for heating said heat activatable bonding agent to sealingly bond said confronting surfaces to each other, leads coupled to said electrical conductor means and extending outwardly of said envelope and outwardly of said gap sealing members for energizing said conductor means, thereby to provide in situ, when said conductor means is energized a vulcanized sealed joint at said respective end surfaces across at least a portion of said gap.

4,084,913

JOINT SOCKET FOR AN ANGLE JOINT

Bernd Schenk, Hamburg, Germany, assignor to ITW-ATECO G.m.b.H., Norderstedt, Germany

Filed Mar. 8, 1976, Ser. No. 664,735
Claims priority, application Germany, Mar. 20, 1975, 2512253
Int. Cl.[2] F16C *11/10*
U.S. Cl. 403—141 **8 Claims**



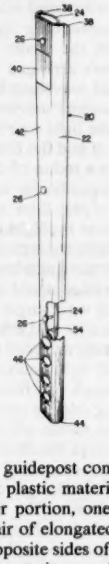
1. A joint socket for an angle joint, especially a ball and socket joint, comprising a bearing basket having a bearing seat for accommodating a pivot and provided with at least one resilient interlocking element to retain the pivot in the bearing seat, said interlocking element comprising a deflectable tongue (**10**;**10***a*) forming a portion of the bearing basket (**4**), said tongue (**10**;**10***a*) including a projection (**16**) forming an undercut which serves as the interlocking element to retain the pivot in the bearing seat, said tongue (**10**;**10***a*) at the rear wall thereof opposite from the bearing seat (**9**) is separated from the remaining part of the bearing basket (**4**) by an open ended slot (**11**;**11***a*) extending the entire depth of the bearing basket and said tongue is further separated at the two side walls thereof by two lateral slots (**12**;**14**;**12***a*;**14***a*), said tongue (**10**;**10***a*) being capable of resilient deflection into said slot (**11**;**11***a*), and at least one displacement member (**20**;**20***a*) capable of being inserted into the slot (**11**;**11***a*) to prevent the resilient deflection of the tongue after the pivot has been mounted in the seat (**9**).

4,084,914

SELF-ERECTING HIGHWAY GUIDE POST

William D. Humphrey, 909 Riverview Ave., and Allen Becker, 101 Hillcrest Dr., both of Selah, Wash. 98942

Filed Jan. 28, 1977, Ser. No. 763,239
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—10 **15 Claims**



1. A self-erecting highway guidepost comprising: a channel of a flexible, impact resistant plastic material having an elongated substantially flat center portion, one surface of which forms a face of the post; a pair of elongated, substantially flat side portions each flanking opposite sides of the center portion at an obtuse angle to the center portion; a pair of curved corner portions each joining a respective side portion to the center portion so that the side portions give rigidity to the channel maintaining the channel in a substantially linear configuration when it is undisturbed, which corner portions uncurve to permit the channel to nondestructively bend when it is struck on the face side, and which corner portions recurve to erect the post again.

4,084,915

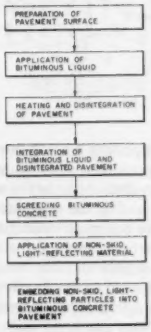
METHOD FOR RECONDITIONING AND RESURFACING PAVEMENT

Nathan Wiseblood, 2000 Presidential Way, West Palm Beach, Fla. 33401

Filed Oct. 4, 1976, Ser. No. 729,027
Int. Cl.[2] E01C *7/06*
U.S. Cl. 404—77 **9 Claims**

1. A method for reconditioning and resurfacing worn bituminous concrete pavement wherein said method consists of: (a) heating and disintegrating the upper portion of said worn bituminous concrete pavement and integrating a bituminous liquid into the disintegrated bituminous concrete pavement, said heating being conducted so that said upper portion is

heated to between about 180° F and about 250° F and said integration of said bituminous liquid being accomplished at least in part during the disintegration of said pavement, (b) screeding the mixture of said bituminous liquid and said disintegrated bituminous concrete pavement so as to restore the original surface grade, (c) applying onto said upper surface of said bituminous concrete pavement a quantity of non-skid, light-reflecting, multi-colored and irregularly-shaped aggregates of an inorganic vitreous pozzolanic material recovered as a residue in the high temperature burning of household waste and garbage, and (d) embedding said non-skid, light-reflecting aggregates into said upper surface of said bituminous concrete pavement so as to form a smooth surface with the aggregates fixed at the top of the pavement, said bituminous liquid being composed of at least one of the following: a combination of oils and asphalt emulsions at a temperature of between 50° F and a combination of oils and cut-back asphalts at a temperature of


PREPARATION OF PAVEMENT SURFACE
APPLICATION OF BITUMINOUS LIQUID
HEATING AND DISINTEGRATION OF PAVEMENT
INTEGRATION OF BITUMINOUS LIQUID AND DISINTEGRATED PAVEMENT
SCREEDING BITUMINOUS CONCRETE
APPLICATION OF NON-SKID, LIGHT-REFLECTING MATERIAL
EMBEDDING NON-SKID, LIGHT-REFLECTING PARTICLES INTO BITUMINOUS CONCRETE PAVEMENT

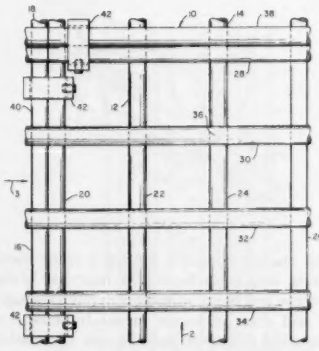
between about 100° F and 200° F, said inorganic vitreous pozzolanic material consisting of about 35 to 55% by weight of a colored, vitreous, light-reflecting substance and about 45 to 65% by weight of a pozzolanic substance, said pavement being disintegrated to a depth of between about 0.5 and about 2.5 inches and said aggregates having a maximum size of about 0.5 inch.

4,084,916

STEEL MESH SYSTEM AND BRACKETS

Charles Senn, 12633 Wilfred Ave., Detroit, Mich. 48213

Filed Dec. 22, 1976, Ser. No. 753,217
Int. Cl.² E01C *11/16*
U.S. Cl. 404—134 **3 Claims**



1. A heavy steel mesh reinforcing system for airport runways or the like comprising at least two steel mesh sections each including a plurality of spaced apart parallel steel bars in each of two mutually perpendicular directions welded together at their intersections and including peripheral bars positioned side by side with one peripheral rod in each mesh section extending parallel to one peripheral rod in the other mesh section and in linear side by side contact therewith, the parallel rods in each of the mesh sections being axially aligned with corresponding rods in another mesh section, and rigid bracket means securing said peripheral rods in side by side contact together, which bracket means comprises a U-shaped member having a substantially straight flat connecting portion and two leg portions extending substantially perpendicularly from the ends of the connecting portion in the same direction defining a recess for receiving the peripheral rods in side by side contact therein, one of said leg portions having a surface forming an inner surface of the recess which is inclined toward the outer end of the connecting portion of the bracket means from the free end of the one leg portion whereby the one leg portion is narrower at the connection thereof with the connecting portion than it is at the free end thereof, the other surfaces of the leg portions of the bracket extending perpendicularly to the connecting portion thereof and a set screw extending perpendicularly through the other leg portion of the bracket having a center line parallel to the connecting portion and outwardly of the other leg portion of the connecting bracket toward the free end thereof from the center line of the peripheral rods in side by side contact whereby the peripheral rods in side by side contact are secured together by the bracket means within the recess formed by the bracket means.

4,084,917

TURNING TOOL, ESPECIALLY FOR COPYING TURNING

Bernard Stumpp, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed Nov. 10, 1976, Ser. No. 740,757
Int. Cl.² B26D *1/00*
U.S. Cl. 407—114 **5 Claims**

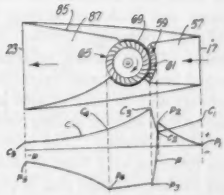
1. A turning plate, especially of hard metal for turning processes and particularly for copier turning, comprising a workpiece-engaging side having a pair of spaced-apart colinear relatively long main cutting edges defining a recess between them, and respective relatively short auxiliary cutting edges adjoining said main cutting edges and having a different angle of attack therefrom upon the workpiece, said short edges constituting flanks of said recess, said main cutting edges are at least several times as long as said auxiliary cutting edges.

4,084,918

WIND MOTOR ROTOR HAVING SUBSTANTIALLY CONSTANT PRESSURE AND RELATIVE VELOCITY FOR AIRFLOW THERETHROUGH

Vladimir H. Pavlecka, Newport Beach, Calif., assignor to Turbomachines, Inc., Irvine, Calif.

Filed Aug. 6, 1974, Ser. No. 495,255
Int. Cl.² F01D *1/14*; F03D *3/04*
U.S. Cl. 415—1 **19 Claims**



1. A method of generating power from wind comprising: providing a turbine in an ambient airstream with the turbine

having a rotor with a plurality of blades and a stator with a plurality of blades upstream of the rotor;

expanding a portion of the ambient airstream by passing some of the ambient airstream through the stator to provide an incoming airstream of less pressure and greater absolute velocity than the ambient airstream;

passing the incoming airstream through the rotor to drive the rotor and to provide an exiting airstream;

conducting the exiting airstream through a duct to increase the pressure and decrease the absolute velocity of the exiting airstream;

discharging the exiting airstream from the duct; and

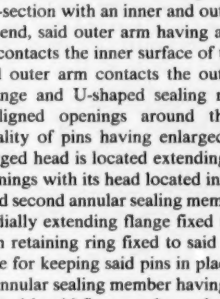
said step of passing being carried out without substantially changing the pressure and relative velocity of the airstream in the rotor.

4,084,919

MEANS OF ATTACHING A SEAL TO A DISK

Edwin Morris, Jr., Lake Park, and David F. Toler, Riviera Beach, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 29, 1976, Ser. No. 701,004
Int. Cl.² F01D *5/20*
U.S. Cl. 415—136 **2 Claims**



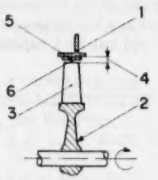
1. In combination, a sealing device for use between a rotating disk having blades and the inner ends of vanes, comprising a disk mounted for rotation, said disk having blades mounted thereon, vanes mounted adjacent to said blades, a ring connected to the inner ends of said vanes, a first annular seal means fixed to the interior of said ring, an annular flange extending axially from said disk having a free end and an inner surface and outer surface, a second annular sealing member fixed to said flange, said second annular sealing member being U-shaped in cross-section with an inner and outer arm, said inner arm having an end, said outer arm having an end, the end of said inner arm contacts the inner surface of the flange and the end of the said outer arm contacts the outer surface of the flange, said flange and U-shaped sealing member having a plurality of aligned openings around the circumference thereof, a plurality of pins having enlarged heads, each pin having an enlarged head is located extending through each of the aligned openings with its head located inside of said flange for retaining said second annular sealing member to said flange, an inwardly radially extending flange fixed to the end of said inner arm, a pin retaining ring fixed to said inwardly radially extending flange for keeping said pins in place, said outer arm of said second annular sealing member having a knife edge seal for cooperating with said first annular seal means.

4,084,920

ARRANGEMENT FOR MAINTAINING OPTIMUM MINIMUM OPERATING CLEARANCE BETWEEN ROTOR AND STATOR COMPONENTS OF FLUID-FLOW MACHINES AND METHOD OF OPERATING THE SAME

Josef Zboril, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 483,076, Jun. 25, 1974, abandoned. This application Jun. 28, 1976, Ser. No. 700,450
Claims priority, application Switzerland, Jun. 29, 1973, 9487/73
Int. Cl.² F01D *11/08*
U.S. Cl. 415—174 **7 Claims**



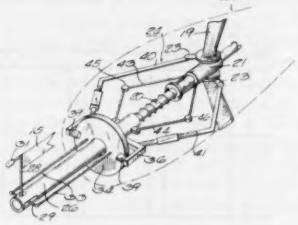
1. In a machine comprising a rotor component and a stator component having oppositely situated surfaces, at least one abradable element provided at one of the surfaces of one of said components and confronting the oppositely situated surface of the other component to define an operating clearance therebetween by abrading particles from the abradable element, the abradable element consists of cast iron and constitutes a growth element compensating for its own abrasion or wear in order to maintain said operating clearance at a size promoting efficient operation of the machine, and said growth element growing under the operational conditions of the machine to thereby compensate for any abrasion or wear to which said growth element is subjected to during operation of the machine.

4,084,921

WINDMILL WITH CYCLICALLY FEATHERING BLADES

Gerald R. Norz, P.O. Box 187, Fish Creek, Wis. 54212

Filed Apr. 5, 1977, Ser. No. 784,896
Int. Cl.² F03D *7/04*
U.S. Cl. 416—17 **6 Claims**

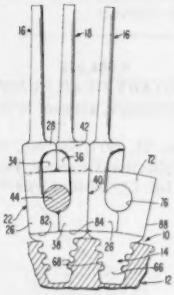


1. A wind energy collector having a rotor turning on a horizontal axis, said rotor having at least one blade pivotly mounted thereon and being adjustable in pitch throughout 360° rotation of said rotor, detector means to sense a deviation between the wind direction and the axis of rotation of said rotor, control means to translate the amount of deviation to the blade and cyclically and differentially to vary the pitch of the blade so that the blade has a flatter pitch when the angle between blade and wind direction is acute and a greater pitch when the angle between blade and wind direction is obtuse, whereby to cause the axis of the rotor to turn into alignment with the wind direction, the differential pitch being zero when the axis of the rotor is in alignment with the wind direction.

4,084,922
TURBINE ROTOR WITH PIN MOUNTED CERAMIC TURBINE BLADES

Robert G. Glenn, Huntingdon Valley, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 27, 1976, Ser. No. 754,722
Int. Cl.[2] F01D 5/32
U.S. Cl. 416—220 R 10 Claims

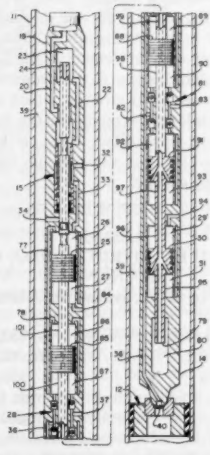


1. In a gas turbine rotor: a rotor disk having an outer periphery; a plurality of blade attachment pieces coupled to the outer periphery of the rotor disk and extending outwardly therefrom, each attachment piece including a root and a pair of axially spaced, radially extending end walls coupled with the root; and a pair of ceramic rotor blades for each attachment piece, respectively, each blade having a base and a blade portion extending outwardly from the base, the bases of the pair of blades of each attachment piece being disposed between the end walls of the attachment piece, each base being provided with an open recess, the open recesses of the bases mating with each other to form a closed recess; and pin means carried by the end walls of each attachment piece, respectively, and extending through the closed recess for coupling the blades to the attachment pieces.

4,084,923
DOUBLE-ACTING, DOWNHOLE PUMP ASSEMBLY

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Continuation-in-part of Ser. No. 632,550, Nov. 7, 1975. This application Jul. 6, 1976, Ser. No. 702,695
Int. Cl.[2] F04B 17/00, 35/00, 21/04
U.S. Cl. 417—393 8 Claims



1. A downhole, hydraulically actuated pump assembly for producing a well comprising an elongated pump housing having an upper and a lower end; a plurality of spaced piston cylinders formed within said housing in axial alignment with one another;

a piston reciprocatingly received within each of said piston cylinders, each said piston dividing its corresponding piston cylinder into upper and lower piston chambers;

means forming a control valve assembly within the upper marginal end of said pump housing, means forming a production inlet passageway at the lower end of said pump housing; means forming a power fluid inlet passageway at the upper end of said pump assembly, an upper fluid chamber located between said power fluid inlet and said valve assembly, means forming a rod balance cavity between said production inlet passageway and the lowermost piston chamber;

a hollow control rod reciprocatingly received within and extending from said upper fluid chamber, through said control valve assembly, and to the uppermost of said pistons; a hollow connecting rod interconnecting each of said pistons, a hollow balance tube extending from the lowermost of said pistons and into said rod balance cavity;

the uppermost chambers of two adjacent uppermost piston cylinders and the lowermost chambers of two adjacent lowermost piston cylinders being engine chambers, there being four piston chambers located between said uppermost and lowermost engine chambers, said four piston chambers being production chambers;

means, including a check valve, forming a produced fluid outlet for each of said production chambers; means, including a check valve, forming a flow path from said production inlet into each of said production chambers;

means forming a power fluid flow path from said power fluid inlet to said control valve assembly;

means forming a first flow passageway which extends from said valve assembly, to said upper fluid chamber, through said control rod, through said connecting rod and the pistons connected thereto, and through the lowermost of said lower pistons into said lowermost piston chambers;

means forming a second flow passageway which extends directly from said valve assembly into said uppermost engine chambers;

and means forming a spent power fluid flow path from said valve assembly by which spent power fluid can be exhausted from said upper and said lower engine chambers through said first and second flow passageways; and,

means by which reciprocal movement of said hollow control rod causes said control valve assembly to alternately connect said first and second flow passageways to said power fluid inlet passageway and said spent power fluid flow path.

4,084,924
PUMP-MOTOR ASSEMBLAGE FOR CIRCULATING A COOLANT

Alexander Ivanoff, 20 Brookside Dr., and Victor Ivanoff, 30 Brookside Dr., both of Greenwich, Conn. 06830

Filed Feb. 25, 1977, Ser. No. 772,066
Int. Cl.[2] F04B 17/00, 35/04
U.S. Cl. 417—424 10 Claims

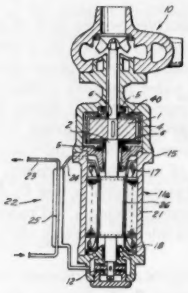
1. A motor-pump assemblage for circulating a coolant through an installation requiring heat transfer, said motor-pump assemblage comprising:

a pump and an electric zero-leakage motor having an extended drive shaft operatively coupled to said pump;

a flywheel mounted on said shaft intermediate the pump and the motor rotationally locked to the shaft;

a freewheeling shroud encompassing said flywheel spaced apart therefrom and rotatable about said shaft and said flywheel, said shroud including passage means providing

ingress and egress of liquid into and out of the space between the shroud and the flywheel; and



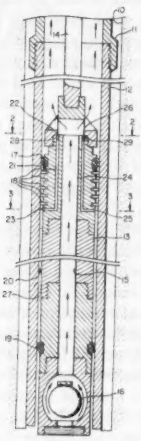
a casing enclosing said motor, flywheel and shroud, said casing being filled with liquid.

4,084,925

OIL WELL PUMP WITH SELF-CONTAINED LUBRICATION

Ruben Jasper Stroud, 11988 N. Ventura Ave., Ojai, Calif. 93023, and Robert Clayton Simonson, 1132 Poli Ave., Ventura, Calif. 93001

Filed Aug. 10, 1976, Ser. No. 713,115
Int. Cl.[2] F04B *21/04;* F01B *31/00*
U.S. Cl. 417—554 **2 Claims**



1. An oil well pump for connection in the lower end of a tubing string including a rod for actuating said pump, comprising, in combination:

a. a tubular barrel;

b. a plunger in said barrel connected to said rod for reciprocating movement and having an inner bore;

c. a check valve incorporated in said inner bore of said plunger;

d. upper and lower spaced seal means on the exterior of said plunger radially extending from the outer wall of said plunger to engage the inside wall surface of said barrel and define therebetween an annular sealed reservoir;

e. a first passage in the wall of said plunger extending between a first exterior port outside said seal means to an inlet port communicating with said annular sealed reservoir;

f. a second passage in the wall of said plunger extending between an outlet port communicating with said annular sealed reservoir and a second exterior port outside said seal means;

g. a lubricating fluid completely filling said annular sealed reservoir; and

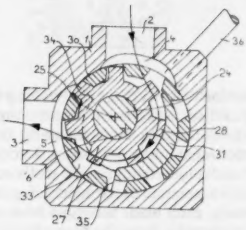
h. plug means sealingly closing said first and second ports after said lubricating fluid has been introduced into said reservoir through said first passage and air therein driven out through said second passage, whereby reciprocating movement of said plunger in said barrel is lubricated by said fluid in said reservoir.

4,084,926

ROTARY GEAR PUMP

Hans Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Feb. 15, 1977, Ser. No. 768,733
Claims priority, application Denmark, Feb. 25, 1976, 793/76
Int. Cl.[2] F04C *15/04*
U.S. Cl. 418—19 **3 Claims**



1. A rotary gear pump comprising two excentrically arranged gear wheels of different sizes, of which the greater gear wheel is rotatably mounted in the generally cylindrical housing of the pump and the smaller gear wheel is mounted upon a shaft which is arranged excentrically in the housing of the pump in such a way that the teeth of the two gear wheels, in the working condition of the pump, are mutually engaged along an area of the inner circumference of the housing of the pump between the outlet of the pump and the inlet of the pump, and are arranged with an interspace between the top circles of the teeth along another part of the circumferences of the wheels, a blocking member being arranged in the interspace with one surface of the blocking member sealing against teeth of the smaller gear wheel and with another surface of the blocking member sealing against teeth of the greater gear wheel, wherein the shaft and the blocking member are mounted rotatably in the housing about the axis of the greater gear wheel together with an element of the housing wherein a duct is provided which, as seen in the circumferential direction of the housing, extends along an angle which is greater than the angle between the inlet of the pump and the outlet of the pump, said duct, moreover, being offset in the circumferential direction with respect to the area along which the greater and the smaller gear wheels engage.

4,084,927

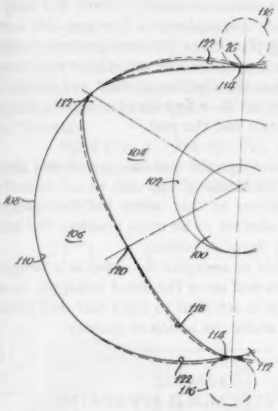
MODIFIED HYPOTROCHOIDAL ROTARY MECHANISM

John K. Amdall, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 7, 1976, Ser. No. 730,493
Int. Cl.[2] F01C *1/02, 21/08, 21/10;* F02B *55/14*
U.S. Cl. 418—61 A **7 Claims**

1. In a hypotrochoidal rotary mechanism including a multinosed rotor having a generally hypotrochoidal peripheral surface, a shaft having an eccentric journalling the rotor, and a housing defining a chamber receiving the rotor and journalling the shaft and having an internal, lobed surface having an enve-

lope determined by the locus of a nose on the peripheral surface of the rotor for a predetermined relative rotation ratio of the rotor, the shaft and the housing, the improvement wherein the said internal surface is nonparallel to and located inwardly



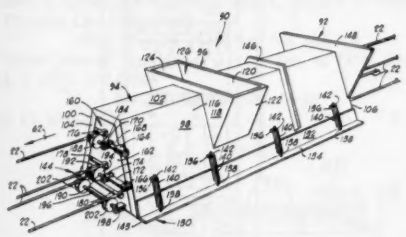
of said envelope immediately adjacent and to either side of the lobe(s) to provide a gentle, continuous curve at the lobe(s) and wherein said peripheral surface is relieved in areas between each nose sufficiently to prevent interference between said surfaces upon rotation of said rotor within said chamber.

4,084,928

SLIP FORM HAVING REINFORCEMENT ACCOMMODATING MEANS

Adolph R. Petersik, Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Nov. 3, 1976, Ser. No. 738,349
Int. Cl.[2] B28B *13/04, 23/06*
U.S. Cl. 425—64 **4 Claims**



1. In an apparatus for forming a continuous barrier on a surface, the barrier formed of concrete material or the like in which at least one continuous reinforcing rod is disposed to extend through the length of the barrier and in which reinforcement cages are disposed at predetermined intervals along the barrier, an improved concrete forming assembly comprising:

a concrete forming member having a forward end, an upper portion and a rearward end, the concrete forming member having a form cavity extending therethrough to intersect the rearward end and the forward end, the formed barrier being extruded from the rearward end of the concrete forming member when the concrete forming member is moved along the surface;

a concrete passing member supported on the upper portion of the concrete forming member and having a concrete delivery opening therethrough having a fluid communication with the form cavity, the concrete passing member disposed between the forward end and the rearward end of the concrete forming member; and

a forward end closing assembly attached to the concrete forming member at the forward end thereof and comprising:

a door member pivotally attached to the forward end having a closed position wherein the door member is positioned transverse to, and in partial blocking relationship to, the form cavity, the door member having a rod clearance channel, and the door member having an open position wherein the door member is positioned clear of the form cavity, the clearance channel permitting the door member to clearingly pass the reinforcing rod; and

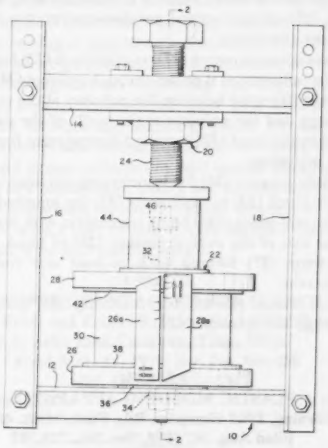
rod positioning means supported by the door member for positioning and guiding the reinforcing rod through the rod clearance channel when the door member is in the closed position.

4,084,929

APPARATUS FOR PRODUCING PACKING RINGS FOR FLUID SYSTEMS AND THE LIKE

John James McGarry, Sr., 1019 Clearview Dr., Middletown, Pa. 17057, and Samuel Edward Jules, 1039 Pennsylvania Ave., R.D. #5, Harrisburg, Pa. 17111

Division of Ser. No. 650,798, Jan. 20, 1976. This application Feb. 25, 1977, Ser. No. 772,102
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—169 **6 Claims**



1. An apparatus for forming annular members, such as packing rings, of substantially any material and with substantially any dimensions with the number of parts in use remaining constant, said apparatus comprising:

a base plate;

a header plate;

an axial pin member extending through and substantially normal to said plates;

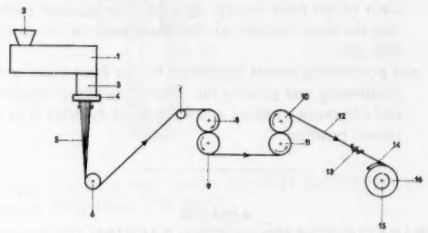
a plurality of concentic cylindrical members selectively arranged in three groups between said plates to define a core, a housing coaxial with said core and defining an annular cavity therebetween, and an annular ram of dimensions substantially equal to said cavity; and

means to apply compressive forces to drive said plates towards each other and against said cylindrical members whereby fiberous packing material deposited in said cavity is compressed into annular form.

4,084,930
APPARATUS FOR THE PRODUCTION OF A YARN HAVING A POTENTIAL CRIMP

Jean-Louis Neveu, Lozanne, France, and Sylvio Melancon, 7235 Chateaubriand, Montreal, Quebec, Canada, assignors to Sylvio Melancon, Quebec, Canada and Agence Nationale de Valorisation de la Recherche, Neuilly (Seine), France

Filed Oct. 26, 1976, Ser. No. 735,747
Claims priority, application France, Oct. 30, 1975, 75 34012
Int. Cl.² B29F *3/02*
U.S. Cl. 425—198 **9 Claims**



1. Apparatus for the production of a yarn having a potential crimp, said apparatus comprising, in combination:

(a) means for feeding polymer under pressure comprising an extruder or a metering pump (**1**);

(b) a block (**23**) connected to the outlet of said feeding means, said block having a central passage (**24–25**) therethrough for the passage of polymer from said feeding means to a spinning head, a frusto-conical upstream portion (**25**) of said central passage converging in a downstream direction;

(c) heat exchange means (**27**) on said block (**23**) for imparting to the polymer, as it passes through passage (**24**) a temperature differential between the polymer at the center of the passage and the polymer at the walls of the passage;

(d) a spinning head (**32**) mounted downstream from block **23** and including:

a single passage (**34**) for transferring polymer issued from the block (**23**) to a spinneret (**37**) the longitudinal axis of the said passge (**34**) being concentric with the longitudinal axis of the central passage (**24**) of block (**23**), and

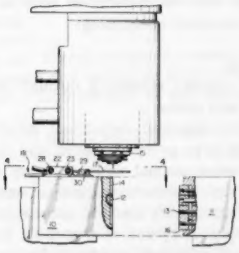
spinneret (**37**) formed with at least one row of holes therein,

(e) and means (**15–16**) for receiving the yarn extruded through the spinneret (**37**).

4,084,931
PLASTIC MOLDING APPARATUS

Bly A. Corning, 1902 Hampden Rd., Flint, Mich. 48503

Filed Aug. 30, 1976, Ser. No. 718,787
Int. Cl.² B29F *1/05*
U.S. Cl. 425—218 **6 Claims**



1. Injection plastic molding apparatus comprising

a pair of dies, said dies forming therebetween an aperture,

means moving said dies toward and away from one another horizontally relative to one another between a closed molding position and an opened position,

a nozzle,

means moving said nozzle vertically toward and away from said aperture such that said nozzle is engageable with said dies for injecting plastic into the cavities thereof when the dies are in closed position and movable away from said dies so that when the dies are opened and the parts are ejected from the molds, a fine drool of plastic may occur between the nozzle and the part,

a hot wire,

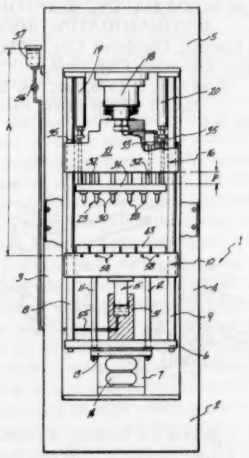
means rigidly mounting said wire on one of said dies, said wire extending from one of said dies to substantially surround said aperture so that when the dies are moved relative to one another to an open position, the hot wire will engage any drool of plastic,

and means operable to energize the wire at a temperature sufficient to melt and sever the drool when the means for moving said dies is actuated to open said dies permitting the part to fall under the action of gravity.

4,084,932
ISOSTATIC MOLD APPARATUS

Kenneth John Morris, Cheveley Park Estate, and Jan Salovsky, Sunderland, both of England, assignors to Olin Energy Systems, Ltd., Sunderland, England

Filed May 13, 1977, Ser. No. 796,571
Claims priority, application United Kingdom, May 20, 1976, 20934/76
Int. Cl.² B30B *5/02, 11/00*
U.S. Cl. 425—405 H **6 Claims**



1. An isostatic pressure molding apparatus comprising:

a. a fixed frame

b. a first bolster assembly slidably mounted on said frame, said first bolster assembly housing at least one mold to which fluid pressure is applied to compact powder disposed therein into a coherant body;

c. a piston mounted on said first bolster assembly and movable therewith, said piston having a passage through which pressure fluid flows to said mold;

d. a pressure fluid reservoir mounted on said frame, said piston extending into said reservoir so that movement of said first bolster assembly in a first direction results in said piston being moved further into said reservoir to cause the fluid therein to flow through said piston passage to said mold; and

e. spring means mounted on said frame separate from said

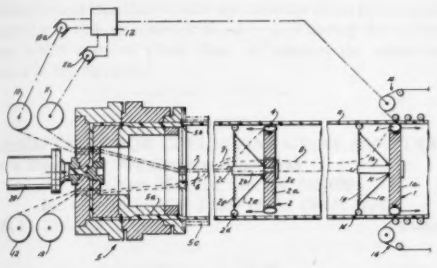
pressure fluid reservoir, means connecting said spring means with said first bolster assembly, said spring means being separable to return said first bolster assembly in a direction opposite to said first direction upon completion of a pressing operation.

4,084,933

APPARATUS FOR THE SEALING OF THE INTERIOR OF SYNTHETIC-RESIN TUBES DURING EXTRUSION

Paul Reitemeyer, and Hans Reifenhauser, both of Troisdorf-Bergheim, Germany, assignors to Reifenhauser KG, Troisdorf, Germany

Filed Dec. 3, 1976, Ser. No. 747,185
Claims priority, application Germany, Dec. 4, 1975, 2554551
Int. Cl.² B29D *23/04*
U.S. Cl. 425—467 **6 Claims**



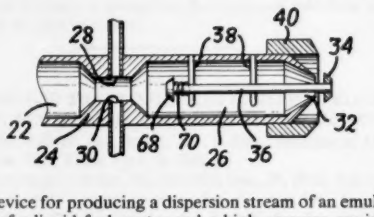
1. An apparatus for the sealing of a synthetic-resin tube continuously produced at a head, said apparatus comprising a pair of axially spaced plugs receivable in such tube; respective tractive elements connected to said plugs for effecting an alternating retraction and advance of said plugs along with such tube; and means including respective conduits connected to each of said plugs for activating same to engage said plugs alternately with the inner wall of such tube.

4,084,934

COMBUSTION APPARATUS

Toshiharu Kumazawa, Fujisawa, Japan, assignor to Mitsubishi Precision Co., Ltd., Japan

Filed May 30, 1975, Ser. No. 582,174
Claims priority, application Japan, Jun. 4, 1974, 49-62516; Feb. 5, 1972, 47-14376
Int. Cl.² F23D *7/00, 11/38*
U.S. Cl. 431—189 **5 Claims**



1. A device for producing a dispersion stream of an emulsive mixture of a liquid fuel, water and a high pressure gas introduced into the device, comprising:

an axially extending first nozzle element having an inlet for axially introducing therein a high pressure gas, a convergent section disposed at a downstream side of the inlet for accelerating said introduced high pressure gas, a divergent section disposed downstream from said convergent section for causing an expansion of said accelerated high pressure gas, a constant diameter section conjoining said convergent and divergent portions for flowing said high pressure gas therethrough, and at least two separate ports opening into said constant diameter section for concurrently but separately introducing said liquid fuel and water, respectively, under pressure into a flow of said high pressure gas through said constant diameter section in a direction perpendicular to a central axis of said first nozzle element, wherein said flow of said high perssure gas is subjected to a hydrodynamic pressure reduction by which said introduced liquid fuel, water and high pressure gas are caused to undergo a first stage mixing and atomizing;

an axially extending tube element for causing a second stage mixing and atomizing of said liquid fuel, water and high pressure gas, said tube element having an upstream and thereof connected to a downstream end of said divergent section of said first nozzle element, a pair of internal radial studs which are axially spaced apart from one another, and an axial rod mounted centrally within said tube element on said studs and extending toward and beyond a downstream end of said tube element, said radial studs enhancing said second stage mixing and atomizing of said liquid fuel, water and said high pressure gas by inducing turbulence in the flow of fuel, water and high pressure gas through said tube element and by collison of the flow against said studs;

a second nozzle element connected to said downstream end of said tube element and having a convergent outlet for accelerating and converging the mixed and atomized stream of said liquid fuel, water and high pressure gas delivered from said tube element, prior to continuous spouting of said mixed and atomized stream from said second nozzle, and

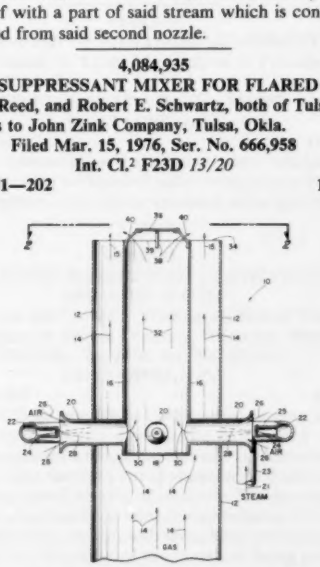
a hollow cylindrical impact disperser held at a downstream side of said convergent outlet of said second nozzle element by said axial rod extending from said tube element, said impact disperser being disposed spaced axially at a distance from said convergent end of said second nozzle element for causing said accelerated and converged stream from said second nozzle element to impinge against said impact disperser thereby causing a third stage mixing and atomizing of said stream of said liquid fuel, water and high pressure gas, said impact disperser comprising means for reflecting and for dispersing said impinging stream into an adjacent combustion space at a wide angle, said distance between said impact disperser and said convergent outlet of said second nozzle element being selected so that said stream reflected by said impact disperser is subjected to a fourth stage mixing and atomizing to form said dispersion stream of said emulsive mixture by collision thereof with a part of said stream which is continuously spouted from said second nozzle.

4,084,935

SMOKE SUPPRESSANT MIXER FOR FLARED GASES

Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Mar. 15, 1976, Ser. No. 666,958
Int. Cl.² F23D *13/20*
U.S. Cl. 431—202 **10 Claims**



1. In an apparatus for smoke-suppression of flare-burned smoke-prone fuels, including:

a. a flare stack conduit for vertical flow of smoke-prone fuel

gases to be burned above the outlet tip thereof; and a supply of smoke suppressant; the improvement comprising:

b. inner conduit means inside of said flare stack, for confining the total flow of said fuel gas to the annular space between said inner conduit means and said stack as a rising cylindrical wall of gas, said inner conduit having a closed upstream end and an open downstream end;

c. said inner conduit adapted to flow the major part of said smoke suppressant upwardly in said inner conduit means and through said open end for juncture with said fuel gases; and including

means at the outlet end of said inner conduit means to divert said smoke suppressant outwardly and upwardly toward and into the inner surface of said cylindrical wall of gas, for intimate mixing therewith.

4,084,936

REDUCING CORROSION IN REACTORS USED FOR THE SYNTHESIS OF CHROMIUM DIOXIDE

Manfred Ohlinger, Frankenthal; Gerhard Wagner, Ludwigshafen; Gerhard Honecker, Ludwigshafen; Heinz Stritzinger, Ludwigshafen, and Heinz Spaehn, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jul. 6, 1976, Ser. No. 702,980
Claims priority, application Germany, Aug. 16, 1975, 2536535
Int. Cl.[2] C23F *11/18*
U.S. Cl. 21—2.7 R 3 Claims

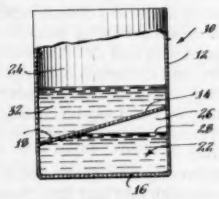
1. A method fo reducing corrosion on the inner walls and fittings of a reactor of iron or iron alloys used for the synthesis of chromium dioxide by hydrothermal conversion of chromium(VI) oxide with chromium oxides of lower oxidation states, wherein lead or bismuth in metallic form or in the form of their oxides, hydroxides and/or salts are added at those points of the reactor at which an aqueous phase occurs during the conversion, which aqueous phase does not contact the chromium oxides to be converted.

4,084,937

RECEPTACLE FOR COLLECTING URINE SAMPLES

Janet Beach, Box 904, Camden, Me. 04843

Filed Nov. 26, 1976, Ser. No. 745,090
Int. Cl.[2] B01L *3/00*; E03D *13/00*; G01N *1/18*
U.S. Cl. 23—259 3 Claims



1. A receptacle useful for collecting urine samples for liquids comprising a wall, a true bottom which joins and is substantially perpendicular to said wall, and a false bottom which joins said wall and has an aperture therethrough at least a portion of the perimeter of said aperture, wherein comprises a portion at least of the edge of said false bottom, and wherein said false bottom is sloped with respect to the true floor of said receptacle and said aperture is located in the region of said false bottom closest to said true floor.

4,084,938

PROCESS FOR TREATING SOLID CARBONACEOUS FOSSIL FUELS AND THE PRODUCTS THUS PREPARED

John Wesley Willard, Sr., Rapid City, S. Dak., assignor to Caw Industries, Inc., Rapid City, S. Dak.

Continuation-in-part of Ser. No. 317,097, Dec. 20, 1972, Pat. No. 3,893,943, which is a continuation of Ser. No. 108,198, Jan. 20, 1971, abandoned. This application Jul. 7, 1975, Ser. No. 593,712
Int. Cl.[2] C10L *9/10*; C10B *57/00*
U.S. Cl. 44—1 R 28 Claims

1. A process for treating solid fossil fuels with an aqueous medium comprising

intimately contacting solid fossil fuel in particulate form selected from the group consisting of coal, lignite, peat and admixtures thereof with an aqueous medium containing a catalytically effective amount of a catalyst,

the solid fossil fuel having active sites therein which react with at least one component of the aqueous medium under liquid phase conditions in the presence of the catalyst,

the particles of the solid fossil fuel being intimately contacted with the aqueous medium under liquid phase conditions until active sites thereof react with at least one component of the aqueous medium,

the catalyst being prepared by a process comprising

admixing a water soluble alkali metal silicate with an aqueous medium containing a dissolved substance which is a source of calcium ion and a dissolved substance which is a source of magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide between about 1×10^{-4} and 1×10^{-1} mole per liter each of calcium ion and magnesium ion,

the aqueous medium containing said dissolved substances in amounts to provide a molar ratio of calcium ion to magnesium ion between about 2.0:1.0 and 1.0:2.0;

the alkali metal silicate having an alkali metal oxide to silicon dioxide ratio between about 0.9:1.0 and less than 2.0:1.0 and being admixed with the aqueous medium in an amount of about 0.05–2 moles per liter,

reacting the alkali metal silicate with said dissolved substances providing calcium ion and magnesium ion to produce an aqueous suspension of finely divided particles of the reaction product,

admixing a micelle-forming surfactant with the aqueous medium in an amount to form catalyst micelles comprising said finely divided particles upon agitating the aqueous medium, and

agitating the aqueous medium containing the finely divided particles and surfactant to form said catalyst micelles.

2. The treated solid fossil fuel prepared by the process of Claim 1.

3. The process of claim 1 wherein the solid fossil fuel is coal.

4,084,939

AUDIBLY BURNING GELLED ALCOHOL

Barney J. Zmoda, Bridgewater, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 22, 1976, Ser. No. 753,241
Int. Cl.[2] C10L *7/04*
U.S. Cl. 44—7 C 13 Claims

1. A stable, audibly burning, alcohol gel composition comprising a major proportion of at least one aliphatic monohydroxy alcohol, a gelling agent, and a minor proportion of rigid, organic capsules containing a volatile solvent.

4,084,940

EMULSIONS OF ENHANCED IGNITIBILITY

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 23, 1974, Ser. No. 535,559
Int. Cl.[2] C10L *1/32*
U.S. Cl. 44—51 11 Claims

1. A high internal phase ratio fuel in water emulsion, said emulsion containing sufficient volatile combustible materials in the exterior phase to render the emulsion more ignitible.

4,084,941

NON-POLLUTING WATERPROOF CLOTH FINISH FOR ABRASIVE CLOTH

William H. Cox, and Norvell E. Wisdom, Jr., both of Watervliet, N.Y., assignors to Norton Company, Worcester, Mass.

Filed Mar. 31, 1976, Ser. No. 672,431
Int. Cl.[2] B24D *11/02*
U.S. Cl. 51—295 3 Claims

1. A woven cellulosic fabric cloth backing having a weight of 4 to 9.5 oz/yd^2 for the manufacture of a coated abrasive sheet by the application to its front face of a mixture of abrasive and phenolic resin, having a cured phenol-formaldehyde backsize containing from 0 to 35% of an acrylic film forming polymer having a glass transition temperature between 10° and 40° C, said backsize lying on the cloth surface and penetrating only partially into the interstices of the yarns and being present in the amount of 3 to 10 pounds of dry coating per ream, the portion of the cloth not adhered to said backsize, being coated

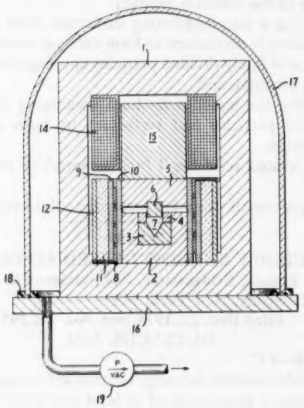
with an acrylic film forming polymer having a glass transition temperature of between 20° and 50° C, said last named polymer being present in the amount of from 0.5 to 4 pounds per ream, and a front size overlying said last named polymer consisting of 30 to 70% by weight of phenolic resin, and from 30 to 70% by weight of a film forming polymer having a glass transition temperature between 20° and 50° C, said front size being present in the amount of from 1 to 4 pounds per ream, dry weight.

4,084,942

ULTRASHARP DIAMOND EDGES AND POINTS AND METHOD OF MAKING

Humberto Fernandez-Moran Villalobos, 59 Dartmouth Rd., Williams Bay, Wis. 53191

Filed Aug. 27, 1975, Ser. No. 608,260
Int. Cl.[2] B24D *3/04, 3/08*
U.S. Cl. 51—307 **28 Claims**



1. A method of making ultrasharp diamond edges and points which comprises preparing ultrafine diamond powder having a particle size of 10 to 100 angstroms, classifying said ultrafine diamond powder to separate out any diamond particles having a particle size larger than 100 angstroms, placing a measured quantity of said powder of which all particles have a particle size less than 100 angstroms in a diamond mold having therein a mold cavity defining an ultrasharp uniform edge or point having a radius of 10 to 100 angstroms, orienting diamond particles in regular array conforming to said edge or point defining cavity of said mold, placing said mold with said diamond powder therein in a gas-tight envelope, evacuating the space within said envelope to achieve an ultrahigh vacuum to thoroughly degas said ultrafine diamond powder and mold, and concurrently applying to said ultrafine diamond powder in said mold a pressure of the order of 50 kb to 90 kb and a temperature of 2000° to 2500° K while maintaining said mold and powder in an ultrahigh vacuum or atmosphere of noble gas to avoid oxidation of said diamond powder, to thereby bond the particles of said diamond powder together to form an ultrahard sintered body having an ultrasharp edge or point as defined by said mold.

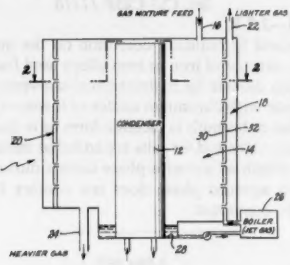
23. A polycrystalline diamond cutting implement having an ultrasharp edge or point, said implement comprising a multiplicity of diamond particles molecularly bonded together with the cohesion of natural diamond, all of said diamond particles being of a size less than 100 angstroms and being uniformly oriented to present like faces to said edge or point to define a continuous uniform edge or point having a radius of from 10 to 100 angstroms.

4,084,943

JET MEMBRANE GAS SEPARATOR AND METHOD

Bernard B. Hamel, Philadelphia, Pa.; Eric P. Muntz, Pasadena, and Paul B. Scott, Topanga, both of Calif., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 461,846, Apr. 18, 1974, abandoned. This application Nov. 11, 1976, Ser. No. 740,864
Int. Cl.[2] B01D *57/00*
U.S. Cl. 55—17 **23 Claims**



1. In an apparatus for separating a lighter gas from a heavier gas in a gas mixture, the combination of:

a. a first chamber for the gas mixture;

b. a second chamber for a mixture enriched in the lighter gas;

c. a wall structure separating said chambers and comprising means providing jet orifices communicating with said first chamber and means providing extraction openings adjacent and aligned with said jet orifices and interconnecting said chambers, said extraction openings having inlet ends communicating with said first chamber and outlet ends communicating with said second chamber, said jet orifices and said inlet ends of said extraction openings facing in the same direction;

d. means for delivering a jet gas to said jet orifices for discharge therethrough into said first chamber;

e. means for delivering the gas mixture to said first chamber; and

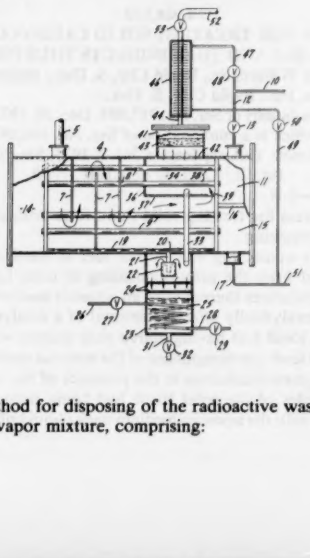
f. means for discharging the lighter gas from said second chamber.

4,084,944

PURE DISTILLATE RECOVERY SYSTEM

Anthony Nicholas Chirico, Short Hills, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Sep. 20, 1976, Ser. No. 724,812
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—27 **9 Claims**



1. A method for disposing of the radioactive waste gas of a gas-water vapor mixture, comprising:

(a) cooling said mixture so as to condense said water vapor;
(b) passing any uncondensed water vapor and said radioactive gas to a chamber where said mixture is cooled to a lower temperature;
(c) flowing condensed water vapors downwardly to and through a sealed boiler; heating said condensed water vapors in said sealed boiler so as to drive off radioactive gas dissolved in said condensed water vapors and also to produce additional water vapors which flow upwardly countercurrent to said condensed water vapors and thereby strip radioactive gas from said condensed water vapors; passing said radioactive gas and additional water vapors directly from said sealed boiler to said chamber without recombining with said mixture;
(d) filtering liquid droplets from the radioactive gas and any uncondensed water vapors exiting from said chamber;
(e) chilling the filtered radioactive gas; and
(f) recovering the condensed water vapors and the chilled radioactive gas at different locations.

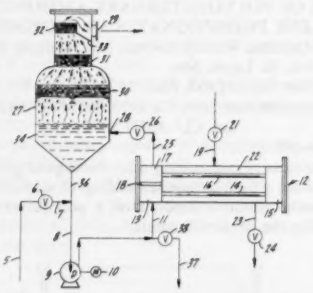
2. Apparatus for separating the gas from the liquid vapor of a gas-liquid vapor mixture, comprising:
(a) means for cooling said mixture so as to condense said liquid vapor comprising a condensation tank containing a plurality of heat transfer pipes through which a heat transfer fluid flows;
(b) a low temperature chamber in said cooling means for further cooling of any uncondensed liquid vapor and said gas, said low temperature chamber comprising means in said tank enclosing the portions of said heat transfer pipes first entered by said heat transfer fluid;
(c) means for collecting condensed liquid vapor and passing same into a boiler; means in said boiler for heating said condensed liquid vapor so as to drive off any gas dissolved therein; conduit means for passing said gas directly from said boiler to said low temperature chamber;
(d) means for filtering liquid droplets from the gas exiting from said low temperature chamber; and
(e) means for chilling the filtered gas.

4,084,945

ENTRAINMENT SEPARATOR APPARATUS

Anthony N. Chirico, Short Hills, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed Aug. 2, 1976, Ser. No. 710,945
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—38 **2 Claims**



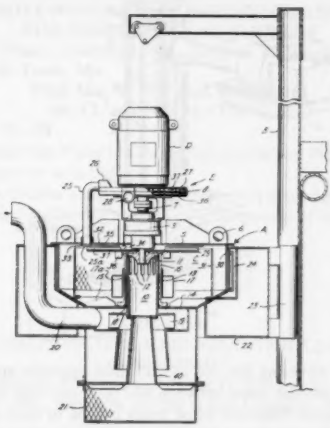
1. A method of disposing of a variable volume flow of aqueous radioactive waste, comprising: heating the waste until the water component vaporizes; passing the vapors and any entrained radioactive water droplets at a varying range of velocities serially through a plurality of water droplet separators having decreasing cross-sectional areas in the direction of vapor flow; the velocity at which said vapors and entrained radioactive water droplets pass through said water droplet separators varying with said variable volume of flow; one of said water droplet separators having a relatively small cross-sectional area being most effective in removing radioactive water droplets when the vapor velocity is at the low end of said range, and another of said water droplet separators having a relatively large cross-sectional area being most effective in removing radioactive water droplets when the vapor velocity is at the high end of said range; removing decontaminated vapors; returning the radioactive water droplets to the waste being heated; and removing concentrated radioactive waste water for disposal.

4,084,946

DRILLING MUD DEGASSER

Harry L. Burgess, c/o Burgess & Associates, Inc., P.O. Box 8534, Houston, Tex. 77009

Filed May 31, 1977, Ser. No. 801,540
Int. Cl.[2] B01D *19/00, 45/00*
U.S. Cl. 55—184 **3 Claims**



1. Degassing apparatus for drilling muds comprising a casing forming a degassing chamber having outer and top walls and a gas discharge opening in said top wall, suction means communicating with said opening, a hollow body extending into said chamber and having an inlet for gas containing mud and peripheral outlet means, power means including a shaft connected to said body for rotating said body to cause centrifugal discharge of mud into the outer portion of said casing, an annular baffle underlying said top wall and said outlet opening, an annular disc rigid with said shaft and extending along said baffle, said top wall, baffle and disc being serially arranged and spaced apart and cooperating to form a labyrinthine path for fluid drawn into said outlet opening, and vanes on said disc for repelling materials suspended in said labyrinthine path.

4,084,947

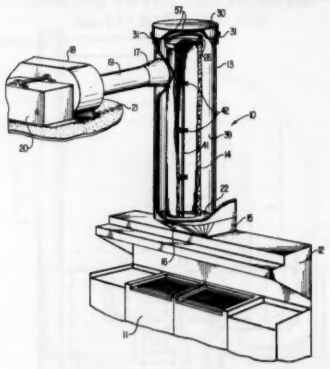
FILTER APPARATUS FOR FAST FOOD KITCHENS EXHAUST

Frank P. Ear, 4326 Flint Hill, San Antonio, Tex. 78230

Filed Jul. 12, 1976, Ser. No. 704,741
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—242 **6 Claims**

1. Pollution control apparatus for removing substantially all visible emissions from the ventilation systems of kitchens having a cooking area comprising a hood positioned above the cooking area of a kitchen, a ventilation duct means connected to the hood and having an outlet opening to the atmosphere outside of the kitchen for conveying gases collected by the hood to the atmosphere outside of the kitchen, an aersol particle coalescing filter enclosed within the ventilation duct means and a blower means connected with the outlet of the ventilation duct means for drawing gases from the hood through the

duct means and the aerosol particle coalescing filter and for discharging the gases into the atmosphere outside of the kitchen after the aerosol particles have been coalesced and removed f.om the gas stream by the coalescing filter, said coalescing filter being an elongated vertically oriented cylindrical filter comprising an annular bed of unbonded glass fibers, said glass fibers having diameters between about 5 microns and 30 microns and said fiber bed being compressed to a bulk density of between about 5 and 20 lbs. per cubic foot, said ventilation duct including a vertically oriented filter housing in which said filter is coaxially mounted, an annular bottom plate closing the bottom of said filter housing having said filter supported thereon, sealing means interposed between said filter and said bottom plate to seal said filter relative to said bottom plate, said bottom plate having a central opening therein communicating with the inside of said cylindrical filter,



a closure covering the end of said filter opposite said bottom plate, an annular space between said filter and said filter housing, the gases from said hood being caused to flow upwardly through the opening in said bottom plate into said cylindrical filter, from whence they pass radially outwardly through the filter into said annular space, the aerosol particles being coalesced by said cylindrical filter and removed from the gas stream, the coalesced liquid aerosol particles flowing by gravity to the bottom of said filter housing within said annular space, said hood being elongated horizontally and mounted horizontally above the cooking area of the kitchen and having an open bottom to receive smoke and gases therethrough, and a top which has an aperture therein and is otherwise closed, said filter housing being disposed vertically adjacent and above said aperture in the top of said hood, and extending upwardly through the roof of said kitchen.

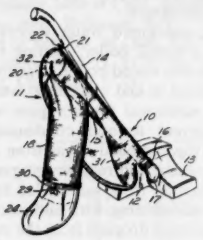
4,084,948

VACUUM CLEANER FILTER BAG ASSEMBLY

Charles H. MacFarland, Rocky River, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 15, 1976, Ser. No. 750,608
Int. Cl.² B01D *46/02*
U.S. Cl. 55—366 **4 Claims**

1. A filter bag assembly for a vacuum cleaner, comprising an elongated, relatively rigid, hollow tube, a coupling member at one end of said tube adapted to be connected to the exhaust outlet of a vacuum cleaner, a porous filter bag having open ends with one end fixed to the end of said tube, a flexible, nonporous bag having an open mouth communicating with the other end of said filter bag to close the filter bag, a porous envelope having an inlet and encasing said hollow tube, said porous bag, and said nonporous bag, said envelope holding said nonporous bag in a collapsed condition at said other end of said porous bag and provided with an access opening and being



openable to expose at least said nonporous bag for removal of said nonporous bag together with dirt collected therein.

4,084,949

SURGICAL FACE MASK FILTERING MEDIUM

Walter F. Biggins, Longmeadow, Mass., assignor to The Dexter Corporation, Windsor Locks, Conn.

Filed Nov. 6, 1975, Ser. No. 629,501
Int. Cl.² B01D *39/14*
U.S. Cl. 55—524 **9 Claims**

1. A porous bacteria filter medium in flexible fibrous sheet form consisting essentially of thermostable micron-diameter filtering fibers and containing from about 5 to about 30 percent by weight of a hot water insoluble heat sealable thermoplastic polymeric binder in fibrous form having a microfibrillar structure made up of microfibrils similar to wood pulp, said binder fibers being randomly dispersed throughout the sheet and fused to the thermostable fibers at the cross-over points of the thermostable fibers to eliminate its fibrous structure and coat said thermostable fibers to provide an effective fiber diameter only slightly greater than the diameter of said thermostable fibers, said filter medium having a bacteria filtration efficiency of at least about 96 percent and sufficient porosity to permit breathability within comfortable limits, the binder fibers prior to fusion exhibiting an average length of about 1–4 mm, a surface area of at least 1 square meter per gram and being comprised of a high molecular weight, low melt index thermoplastic polymeric material.

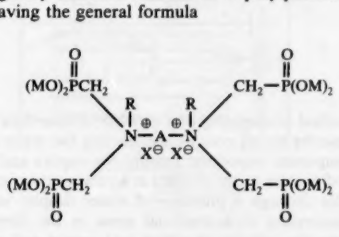
4,084,950

USE OF POLYQUATERNARY AMMONIUM METHYLENE PHOSPHONATES AS MICROBIOCIDES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 237,883, Mar. 24, 1972, Pat. No. 3,792,084.
This application Nov. 12, 1973, Ser. No. 414,946
Int. Cl.² A01N *9/36*
U.S. Cl. 71—67 **9 Claims**

1. The process of controlling microbiological growth in an aqueous system which comprises adding to said system a microbiologically effective amount of a polyquaternary compound having the general formula



where R is alkyl, aryl, alkenyl, alkaryl, aralkyl or cycloalkyl; A is alkylene having 2 to 10 carbon atoms, aralkylene having 8 to 10 carbon atoms, dialkylene ether wherein each alkylene group

has 1 to 10 carbon atoms, alkenylene or alkinylene; M is hydrogen, ammonium, an alkali metal or an alkaline earth metal; and X is Br, I, or Cl.

4,084,951

SILICON COMPOUNDS CONTAINING NUCLEOFUGAL PHOSPHATE GROUP AND METHOD OF REGULATING PLANT GROWTH THEREWITH

Maurice James Gregory, Kuala Lumpur, Malaysia, assignor to Ciba-Geigy AG, Switzerland

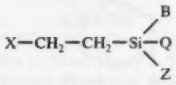
Division of Ser. No. 249,553, May 2, 1972, Pat. No. 3,898,257. This application May 12, 1975, Ser. No. 576,291

Claims priority, application United Kingdom, May 3, 1971, 12798/71

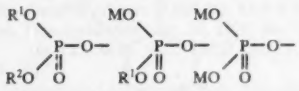
Int. Cl.[2] A01N *9/36;* **C07F** *7/02, 7/04*

U.S. Cl. 71—86 **12 Claims**

1. A compound having the formula:



wherein X is selected from



where M is hydrogen or ammonium; R^1 and R^2 are the same or different and each is an open chain or cyclic hydrocarbon group containing from 1 to 18 carbon atoms;

and B, Q and Z are the same or different and each is selected from the group consisting of:

(i) chlorine or bromine,

(ii) alkyl having from 1 to 18 carbon atoms,

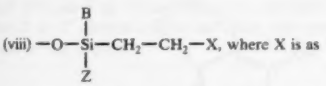
(iii) alkoxy having from 1 to 18 carbon atoms,

(iv) phenyl or tolyl,

(v) hydroxyl,

(vi) thiol or alkylthio,

(vii) dialkylamino,



defined above, and B and Z are as defined in any one of groups (i) to (vii), (ix) and (x) hereof,

(ix) $-CH_2-CH_2-X$, where X is as defined above,

(x) hydroxy-substituted or halogen-substituted alkyl or alkoxy,

said compound being capable of decomposing in water to provide ehtylene.

11. A method of regulating plant growth, which method comprises applying to a plant a compound as claimed in claim 1 in an amount of from 0.1 pounds to 20 pounds of active ingredient per acre.

4,084,952

USE OF ALKYL(AMINOCARBONYL)PHOSPHONATE SALTS IN RICE CULTURE FOR THE CONTROL OF PROBLEM HERBACEOUS PLANT GROWTH

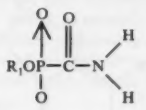
James K. Reynolds, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 25, 1976, Ser. No. 699,934

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—86 **3 Claims**

1. A method for the control of arrowhead or nutsedge weeds in rice fields which comprises applying to the foliage of the weeds while they are growing, but after rice harvest, an effective amount of a compound of the formula



wherein

R_1 is alkyl of 1 through 4 carbon atoms, or alkenyl of 3–4 carbon atoms;

M is hydrogen, ammonium or an alkali metal.

4,084,953

N-HYDROXY-N-PHOSPHONOMETHYLGLYCINES AND THE HERBICIDAL USE THEREOF

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1977, Ser. No. 776,061

Int. Cl.[2] A01N *9/36;* **C07F** *9/38*

U.S. Cl. 71—86 **6 Claims**

1. N-hydroxy-N-phosphonomethylglycine and the herbicidally acceptable salts thereof.

5. A herbicidal method which comprises applying to plants a herbicidally effective amount of a compound of claim 1.

4,084,954

BIOCIDALLY-ACTIVE 1,3-BENZODITHIOLE-2-ONE COMPOUNDS

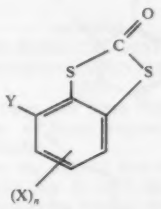
Khalid Rasheed, Weslaco, and James D. Warkentin, McAllen, both of Tex., assignors to The Ansul Company, Marinette, Wis.

Filed Sep. 30, 1975, Ser. No. 618,255

Int. Cl.[2] C07D *339/06;* **A01N** *9/12*

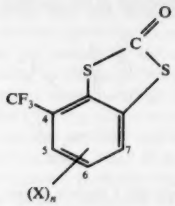
U.S. Cl. 71—90 **85 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein Y is selected from nitro, trifluoromethyl and alkylsulfonyl; X is selected from alkyl and alkenyl of up to 6 carbon atoms, nitro, trichloromethyl, trifluoromethyl, trifluoromethoxy, trifluoromethylthio, trifluoromethylsulfoxyl, trifluoromethylsulfonyl, methoxymethyl, cyano, carboxy, carbamyl, halogen (F, Cl, Br, I), hydroxy, acetylamino, amino, N-phenylamino, N,N-diallylamino, alkoxy, dimethylaminodithiocarbamyl, carboalkoxy, alkylthio, mono- and dialkylamino, N-alkylcarbamyl, N,N-dialkylcarbamyl, alkylsulfoxy, alkylsulfonyl, said alkyl groups containing from 1 to 4 carbon atoms; *n* is an integer from 0 to 3; and salts thereof.

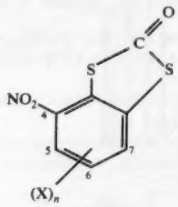
32. A method of treating weeds associated with growing plants to beneficially enhance the growth and/or yieldpotential of said growing plants which comprises applying a herbicidally active amount of a compound of the formula:



wherein n is 2 and X is NO_2 in the 6 position and is N,N-diallylamino or dilowerakylamino in the 7 position, at a rate of from 0.5 lbs. a.i./acre to 8.0 lbs. a.i./acre.

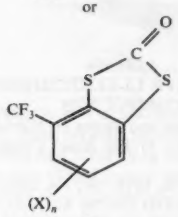
36. A method of treating soil fungi associated with growing plants to beneficially enhance the growth and/or yieldpotential of said growing plants which comprises applying a soil fungicidally active amount of a compound of the formulae:

F



or

G



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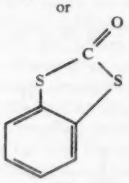
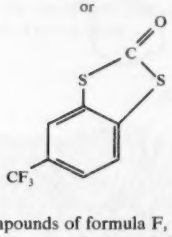
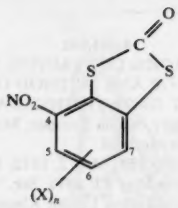


or

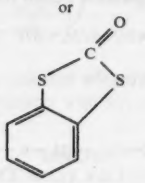


wherein for compounds of formula F, n is 0–2, and when n is 1, X is 6-CF_3 or 6-fluoro and when n is 2, X is 6-CF_3 and 7-halogen or 7-dimethylaminodithiocarbamyl; and wherein for compounds of formula G, n is 2 and X is 6-NO_2 and 7-mono- or 7-diloweralkylamino, 7-loweralkylthio, at a rate of from 0.25 to 40.0 lbs. a.i./acre.

50. A method of treating foliar fungi associated with growing plants to beneficially enhance the growth and/or yieldpotential of said growing plants which comprises applying a foliar fungicidally active amount of a compound of the formulae:



or



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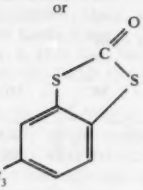
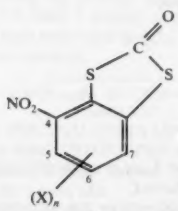


wherein n is 1 and X is 6-CF_3, 6-NO_2 or 6-CN at a rate of about 200 parts per million in a suitable solvent.

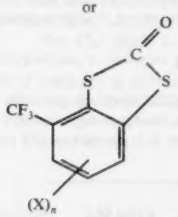
56. A method of treating acarines associated with growing plants to beneficially enhance the growth and/or yield-potential of said growing plants which comprises applying an acaricidally active amount of a compound of the formulae:

H

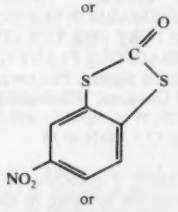


or

I



or



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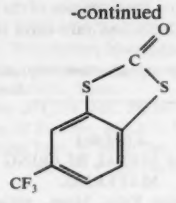


wherein for compounds of formula H, *n* is 0–2 and when *n* is 1, X is 6-CF_3, 6-NO_2, 6-loweralkyl or 6-fluoro and when *n* is 2, X is 6-CF_3 and 7-halogen; wherein for compounds of formula I, *n* is 2 and X is 6-NO_2 and 7-mono or 7-diloweralkylamino, 7-diallylamino or 7-loweralkylthio, at a rate of from 30 to 1000 parts per million in a suitable solvent.

4,084,955

ORGANIC COMPOUNDS AND PROCESS

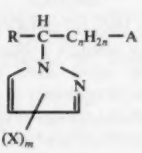
Gabriel Kornis; Eldon G. Nidy; Henry J. Vostral, all of Kalamazoo, Mich., and Arnolds Steinhards, deceased, late of Kalamazoo, Mich. by John J. Killinger, assignors to the Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 316,902, Dec. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 12,871, Feb. 19, 1970, abandoned. This application Apr. 28, 1976, Ser. No. 681,239

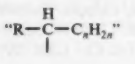
Int. Cl.[2] A01N *9/22*; **C07D** *231/14*

U.S. Cl. 71—92 **36 Claims**

1. New 1-(substituted-hydrocarbyl)-di- and trihalopyrazoles of the formula:



wherein "*n*" is an integer 0, 1, 2, or 3; "X" is a bromine on chlorine atom; "*m*" is the integer 2 or 3, the bromine or chlorine atoms being selected independently; "R" is hydrogen, alkyl of from 1 to 10 carbon atoms, inclusive, or alkenyl of from 2 to 10 carbon atoms, inclusive, the sum of the carbon atoms in the group



being not more than 11; and "A" is the carboxyl group and alkali metal, alkaline earth metal, ammonium and amine salts thereof, a hydroxymethyl lower-alkanoate group in which the lower-alkyl moiety is of from 1 to 8 carbon atoms, inclusive, a carboxylic lower-alkyl ester group wherein "lower-alkyl" is of from 1 to 8 carbon atoms, inclusive.

4,084,956

BARBAN FORMULATION

William C. Doyle, Jr., Leawood, and Marion F. Botts, Merriam, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 697,585, Jun. 18, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,807

Int. Cl.[2] A01N *9/20*

U.S. Cl. 71—111 **3 Claims**

1. A selectively herbicidal composition which comprises, by weight,

(a) 20 to 30 percent barban, as the sole herbicidal agent,

(b) 5 to 25 percent of a waxy solid condensation product of C_{12} to C_{18} fatty alcohols with 10 to 40 units of ethylene oxide

(c) at least 0.5 parts per part of component (b) of an emulsifier, selected for ability to emulsify barban, and

(d) the balance a solvent comprising a major proportion of alkylbenzenes or alkylnaphthalenes along with a minor proportion of other hydrocarbons within or above kerosene boiling range.

4,084,957

PROCESS FOR PRODUCING SHAPED BODIES

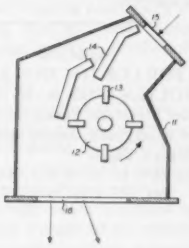
Heinz-Hubert Ernst, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 23, 1975, Ser. No. 615,965

Claims priority, application Germany, Sep. 24, 1974, 2445511

Int. Cl.[2] C22B *1/24*

U.S. Cl. 75—3 **3 Claims**



1. A process for producing shaped bodies from mixed iron oxide dusts, at least one of which is in moist or mud form and at least one of which has thixotropic properties, which comprises beating such dusts in the presence of a total amount of moisture corresponding to the desired final moisture content, in an impact mill or beater mill thereby to form a flowable particulate mass, and forming the mass into shaped bodies.

4,084,958

METHOD OF REDUCING FINELY GRAINED MATERIAL CONTAINING IRON OXIDES IN A FLUID BED

Per Harald Collin, Falun, and Bjorn Widell, Vesteras, both of Sweden, assignors to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Continuation of Ser. No. 578,422, May 19, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 810,977

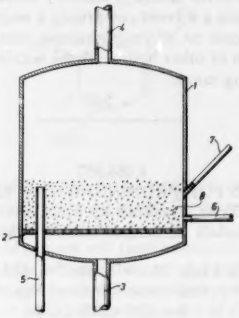
Claims priority, application Sweden, May 20, 1974, 7406695

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—36 **4 Claims**

1. A method of preventing sticking or agglomeration between solid particles of iron oxide, partially reduced iron oxide, and carbonaceous material during reduction in a fluidized bed of these particles in a fine-grained form comprising the steps of: introducing at one or more supply points in a fluidized bed zone a fine-grained carbonaceous material containing at least 15% volatiles; introducing oxygen in said fluidized bed; maintaining a combustion in said bed by reacting part of said carbonaceous material with oxygen; the temperature in the bed being substantially higher than the temperature required for driving off said volatiles in said carbonaceous material, whereby the high temperature causes volatiles to be rapidly driven off within limited zones around said supply points; directing the stream of said fine-grained particles containing

iron oxides to substantially coincide with said limited zones thereby causing to a substantial extent said fine-graned parti-



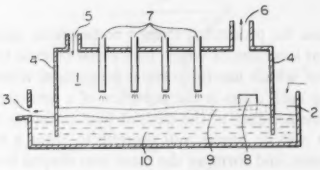
cles of the iron oxide containing material to adhere to particles of carbonaceous material.

4,084,959

METHOD FOR CONTINUOUS REFINING OF A MOLTEN IRON BASE METAL

Satomi Yamamoto; Masataka Yoshii; Teruo Matsuo, and Teruo Yokoozi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,722
Int. Cl.[2] C21C *3/04, 7/02*
U.S. Cl. 75—53 **23 Claims**



1. A method for continuously refining a molten iron base metal, wherein the combination of dephosphorization and desulfurization occurs in a single stage, which method comprises continuously introducing the metal to be thus refined into a refining vessel which is substantially closed to the atmosphere outside said vessel and simultaneously therewith introducing a flux containing at least 50% of an alkali metal carbonate-containing salt into said vessel to refine said metal under oxidizing conditions; discharging substantially all of the by-product, generated during the refining step, from said vessel; recovering the refined metal; recovering an alkali metal, in the form of an alkali metal carbonate-containing salt, from said by-product; and recycling the recovered alkali metal carbonate-containing salt for use as a flux in the refining step.

4,084,960

METHODS OF DESULPHURIZING IRON AND STEEL AND GASES, SUCH AS STACK GASES AND THE LIKE

D. Alan R. Kay, Hamilton, Canada, and William G. Wilson, Pittsburgh, Pa., assignors to Molycorp, Inc., White Plains, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,525
Int. Cl.[2] C21C *7/02*
U.S. Cl. 75—58 **10 Claims**

1. A method of desulphurizing molten iron, steel, stack gases containing sulfur as an impurity comprising the steps of:

a. reacting rare earth oxide in the presence of one of a separate deoxidizing agent and a deoxidizing atmosphere with sulphur to be removed to form one of the group consisting of rare earth sulphides and rare earth oxysulphides and mixtures thereof, and

b. removing said oxysulphides and sulphides.

4,084,961

TREATMENT OF METAL BEARING MINERAL MATERIAL

Frank Caldon, Thompson Falls, Mont., assignor to Sunshine Mining Company, Kellogg, Id.

Filed Sep. 10, 1976, Ser. No. 722,194
Int. Cl.[2] C22B *15/08, 11/04*
U.S. Cl. 75—101 R **20 Claims**

1. Process for recovering acid leachable metal values from metal bearing mineral material which comprises pressure leaching such metal bearing mineral material with an aqueous liquid containing about 50–260 g/l of sulfuric acid and about 0.5–5 g/l of nitric acid under oxygen pressure, to dissolve such acid leachable metal values from said mineral material into said aqueous liquid.

4,084,962

AFTER-TREATING ALLOY FOR MAKING NODULAR IRON

Michael Robinson, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 471,684, May 20, 1974, Pat. No. 3,955,973. This application Mar. 30, 1976, Ser. No. 672,048
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 A **4 Claims**

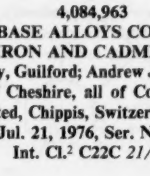
1. An after-treating alloy for adding to molten nodular iron prior to casting which provides a reduction in the amount of graphite-spheroidizing agent used to obtain a desired nodularity which consists essentially of a base alloy compatible with said nodular iron and selected from the group consisting of ferrosilicon and nickel alloys and from 0.8 to 1.8 weight percent magnesium.

4,084,963

ALUMINUM BASE ALLOYS CONTAINING ZINC, MAGNESIUM, IRON AND CADMIUM, TIN OR LEAD

William H. Anthony, Guilford; Andrew J. Brock, and Damian V. Gullotti, both of Cheshire, all of Conn., assignors to Swiss Aluminium Limited, Chippis, Switzerland

Filed Jul. 21, 1976, Ser. No. 707,186
Int. Cl.[2] C22C *21/00*
U.S. Cl. 75—138 **8 Claims**



1. An aluminum base alloy which is resistant to corrosion, said alloy consisting essentially of up to 2.0% by weight zinc, up to 5.0% by weight magnesium, up to 0.1% by weight iron, up to 0.1% by weight silicon, and a mixture of cadmium, tin and lead, in amounts ranging from 0.05 to 0.3% by weight for each of cadmium and tin and from 0.01 to 0.2% by weight for lead, balance aluminum.

4,084,964

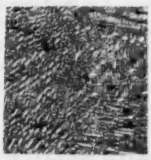
HIGH HFC-CONTAINING ALLOYS

Nicholas J. Grant, Winchester, Mass., and Ramon K. Robinson, Richland, Wash., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 371,318, Jun. 18, 1973, abandoned, which is a continuation of Ser. No. 664,207, Mar. 5, 1976. This application Mar. 5, 1976, Ser. No. 664,208

Int. Cl.[2] C22C *19/08*

U.S. Cl. 75—171 4 Claims



1. A cobalt-based alloy having a uniform dispersion of extremely fine and stable microconstituent phases, that consists essentially of 10–30 weight % chromium, 4–12 weight % tungsten and/or molybdenum, hafnium carbide of particle size less than 3 microns and in the range 2 to 15% by volume, and the rest a ductile, tough, oxidation-resistant cobalt matrix and incidental impurities, all the Hf and the C in the alloy being in the form of HfC.

4,084,965

COLUMBIUM POWDER AND METHOD OF MAKING THE SAME

Stanley S. Fry, North Chicago, Ill., assignor to Fansteel Inc., North Chicago, Ill.

Filed Jan. 5, 1977, Ser. No. 756,764

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.[2] C22C *1/04;* H01G *9/05*

U.S. Cl. 75—230 18 Claims

1. A columbium powder containing an added phosphorus-containing material in an amount equivalent to from about 5 to about 600 parts per million of elemental phosphorus.

9. A columbium anode prepared by pressing columbium powder into the shape of an anode, adding to said pressed columbium powder a phosphorus-containing material in an amount equivalent to from about 5 to about 600 parts per million of elemental phosphorus, and thereafter sintering said pressed columbium powder.

4,084,966

IMAGING SYSTEM USING AGGLOMERABLE MIGRATION MARKING MATERIAL

Werner E. L. Haas, Webster; James E. Adams, Ontario, and Bela Mechlowitz, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 755,163, Aug. 26, 1968, abandoned. This application Oct. 26, 1970, Ser. No. 84,018

Int. Cl.[2] G03G *21/00;* G03C *5/04*

U.S. Cl. 96—1 PS 24 Claims

1. An imaging method comprising:

providing an imaging member comprising a layer of softenable material containing agglomerable migration marking material, and

imagewise exposing said member to an image pattern of electromagnetic radiation of sufficient energy to cause the agglomerable migration marking material in the exposed areas to imagewise migrate at least in depth in the softenable layer and simultaneously agglomerate, whereby the effective cross-sectional area of the marking material in the imagewise exposed area is reduced.

4,084,967

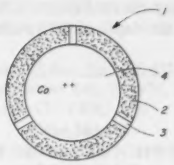
PHOTOGRAPHIC ELEMENTS CONTAINING VESICLES OF RHODOPSIN AND LIPIDS

David Frank O'Brien, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 9, 1977, Ser. No. 767,015

Int. Cl.[2] G03C *5/24, 5/54, 1/52, 1/00*

U.S. Cl. 96—29 R 44 Claims



1. A photographic element comprising a support having thereon a layer comprising a hydrophilic binder containing numerous vesicles, said vesicles comprising a matrix of lipid membranes containing rhodopsin and, within said vesicles encompassed by said membranes, a member of the group consisting of

(a) metal cations and

(b) materials selected from the group consisting of chelatometric materials for said metal cations, colorimetric reagents for said metal cations, materials which are caused to react by the presence of said metal cations to form a gas or a visible reaction product, and materials which form elemental metal through redox reactions with said metal cations and located outside of the vesicles either in the same layer or in a contiguous layer, a member of the group consisting of

(a) metal cations and

(b) materials selected from the group consisting of chelatometric materials for said metal cations, colorimetric reagents for said metal cations, materials which are caused to react by the presence of said metal cations to form a gas or a visible reaction product, and materials which form elemental metal through redox reactions with said metal cations

wherein if the vesicles contain (a) the areas outside the vesicles contain (b) and if the vesicles contain (b) the area outside the vesicles contain a) with the proviso that (b) is not present both in the area inside the vesicles and the area outside the vesicles and that the difference in metal cation concentration inside the vesicles and outside the vesicles is at least about 10^2.

4,084,968

METHOD OF MANUFACTURING ELECTRICALLY CONDUCTIVE METAL LAYERS ON SUBSTRATES

Casper Johannes Gerardus Ferdinand Janssen; Lambertus Postma, and Gerardus Johannes Meinardus Lippits, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 507,679, Sep. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 453,838, Mar. 22, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,100

Claims priority, application Denmark, Mar. 30, 1973, 4429/73

Int. Cl.[2] G03C *5/24, 5/00*

U.S. Cl. 96—48 PD 4 Claims

1. In a method of photochemically metal-plating desired portions of a synthetic resin substrate containing, at least in a surface layer, homogeneously finely dispersed particles of a photo-sensitive semiconductive metal oxide, the light reaction product of which is capable of depositing metals at least as high as copper in the E.M.F. series of metals from a solution of the respective metal salt, by exposing desired portions of said substrate to light and contacting said substrate with said solution of the metal salt thereby causing a metal nuclei image to be

formed at the exposed areas of the substrate and then intensifying said metal nuclei image by treatment of the substrate with an electroless plating bath, the improvement wherein as a pretreatment the metal oxide containing substrate before exposure is first contacted with a dipolar aprotic solvent capable of slightly swelling said substrate for a time such that a slight swelling of the substrate is caused and a swollen layer is formed and then with a chemical roughening agent comprising a solution of an inorganic oxidizing acid for a time sufficient to oxidize about half the depth of the swollen layer.

4,084,969

COLOR PHOTOGRAPHIC PROCESS

Koichi Nakamura, and Isao Shimamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 13, 1976, Ser. No. 750,342
Claims priority, application Japan, Dec. 12, 1975, 50-148004
Int. Cl.[2] G03C *5/32, 1/06*
U.S. Cl. 96—60 R **21 Claims**

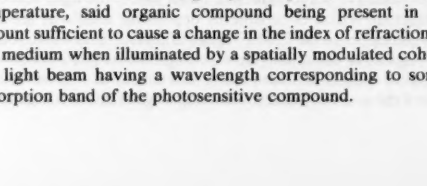
1. In a color photographic process wherein an imagewise exposed color photographic material having at least one silver halide photographic emulsion layer is processed by development in the presence of a primary aromatic amine color developing agent to form dye images, the improvement which comprises using silver iodobromide containing at least about 2 mole percent silver iodide as the silver halide in at least one silver halide photographic emulsion layer and performing the processing of the color photographic material at a temperature of 60° to 80° C for causing an oxidation reduction reaction of a cobalt (III) complex present in the color photographic material or in a processing solution with the primary aromatic amine color developing agent.

4,084,970

ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA USING SUCROSE BENZOATE

Allen Bloom, East Windsor; Daniel Louis Ross, Princeton; Robert Alfred Bartolini, Trenton, all of N.J., and Ling Kong Hung, New York, N.Y., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 498,771, Aug. 19, 1974, abandoned.
This application Feb. 27, 1976, Ser. No. 661,813
Int. Cl.[2] G03C *1/00, 5/04;* **G02B** *3/00*
U.S. Cl. 96—88 **9 Claims**



1. A holographic recording medium comprising a host material containing a photosensitive organic compound, said host material consisting essentially of sucrose benzoate wherein said sucrose benzoate is a hard, glassy, transparent solid at room temperature, said organic compound being present in an amount sufficient to cause a change in the index of refraction in the medium when illuminated by a spatially modulated coherent light beam having a wavelength corresponding to some absorption band of the photosensitive compound.

4,084,971

PROTECTIVE COATINGS FOR FERROUS METALS

Thomas Ginsberg, Piscataway, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,737
Int. Cl.[2] C09D *5/10*
U.S. Cl. 106—1.17 **8 Claims**

1. In a composition for protecting ferrous metals from corrosion comprising a partially hydrolyzed organic silicate and particulate zinc, the improvement which comprises adding a curing amount of a fatty acid amidoamine formed by the interaction of about one mole of at least one ethylenically unsaturated fatty acid having 10 to about 24 carbon atoms and about one mole of an alkylene polyamine containing two primary amine groups and at least one secondary amine group wherein the alkylene group contains about 2 to about 5 carbon atoms.

4,084,972

GLASS-CERAMICS WITH METALLIC IRON SURFACES

Ronald L. Andrus, Elmira, and Richard F. Reade, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,585
Int. Cl.[2] C03C *3/22;* **C03B** *32/00*
U.S. Cl. 106—39.7 **6 Claims**

1. A method for making a glass-ceramic article composed of a body portion and an integral surface layer demonstrating electrically conductive properties, said body portion consisting essentially of crystals dispersed within a glassy matrix, said crystals being present in amounts in excess of 50% by volume and being selected from the group consisting of beta-spodumene solid solution and nepheline, and said surface layer consisting essentially of alpha-iron crystals dispersed within a glassy matrix and being present in amounts in excess of 50% by volume, consisting of the steps of:

(a) melting a batch for a glass having an overall composition selected from the group:

(A) a glass consisting essentially, in weight percent on the oxide basis of about 3–6% Li_2O, 1–5% FeO, 15–25% Al_2O_3, 50–75% SiO_2, and 2–7% RO_2, wherein RO_2 consists of 2–6% TiO_2 and 0–3% ZrO_2; and

(B) a glass approximating the stoichiometry of nepheline consisting essentially, in weight percent on the oxide basis, of about 10–20% Na_2O, 1–5% FeO, 30–37% Al_2O_3, 36–42% SiO_2, 0–10% K_2O, and 2–7% RO_2, wherein RO_2 consists of 2–6% TiO_2 and 0–3% ZrO_2;

(b) simultaneously cooling the melt to a temperature at least within the transformation range thereof and forming a glass article therefrom;

(c) exposing said glass article in an oxidizing atmosphere to a temperature of at least about 1000°, but not in excess of

about 1300° C., for a period of time sufficient to cause the growth of crystals selected from the group consisting of beta-spodumene solid solution and nepheline in situ in the body portion of said article and the growth of hematite crystals in situ in an integral surface layer on said article thereby producing a glass-ceramic article; and thereafter

(d) subjecting said glass-ceramic article to an essentially dry, gaseous reducing atmosphere at a temperature between about 500°–800° C. for a period of time sufficient to reduce the hematite crystals in said surface layer to alpha-iron crystals to product an electrically conductive surface layer.

6. Glass ceramic article made in accordance with the method of claim 1.

4,084,973

GLASS ARTICLES WITH HEMATITE AND/OR MAGNETITE AND/OR METALLIC IRON SURFACES

Ronald L. Andrus, Elmira, and Richard F. Reade, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 7, 1977, Ser. No. 757,584

Int. Cl.[2] C03C *3/22*; C03B *32/00*

U.S. Cl. 106—39.7 **19 Claims**

1. A method for making a glass article composed of a body portion essentially free from crystallization with an integral surface layer containing hematite crystals dispersed within a glassy matrix, said surface layer being highly crystalline exhibiting a mirror-like appearance, a metallic luster appearance, or a dull earthen appearance, consisting of the steps of:

(a) melting a batch for a glass consisting essentially, in weight percent on the oxide basis, of about 1–15% R_2O, wherein R_2O consists of 0–10% Li_2O and 0–15% Na_2O and/or K_2O, 0.3–13% FeO, 15–35% Al_2O_3, 55–80% SiO_2, and 0–5% TiO_2 and/or ZrO_2;

(b) simultaneously cooling the melt to at least below the transformation range and forming a glass article therefrom;

(c) exposing said glass article in an oxidizing atmosphere to a temperature between about 675°–950° C. for a period of time sufficient to cause the growth of hematite crystals in situ in an integral surface layer on said glass article; and then

(d) cooling said article to room temperature.

5. A surface crystallized glass article made in accordance with method claim 1.

4,084,974

METHOD OF MAKING LIGHT-ABSORBING GLASS-CERAMIC ARTICLES

George H. Beall, Big Flats, and Hermann L. Rittler, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 22, 1977, Ser. No. 817,925

Int. Cl.[2] C03B *32/00*; C03C *3/22*

U.S. Cl. 106—39.7 **4 Claims**

1. A method for producing a light-absorbing glass-ceramic article exhibiting blue-to-black coloration wherein beta-quartz and/or beta-spodumene constitutes the principal crystal phase which comprises the steps of:

(a) compounding a batch for a lithium aluminosilicate glass which is thermally crystallizable to beta-quartz or beta-spodumene, said batch including a source of TiO_2 as a nucleating agent and a glass reducing agent in an amount at least sufficient to reduce at least some of the Ti^{+4} species present in the batch to Ti^{+3} species at batch melting temperatures, wherein the glass reducing agent is a carbonaceous reducing agent selected from the group consisting of carbon, sugar and starch;

(b) melting the batch to form a glass melt containing Ti^{+3} species and forming a glass article from the melt; and

(c) heat-treating the glass article to obtain crystallization in situ thereof to a light-absorbing glass-ceramic article exhibiting blue-to-black coloration and comprising beta-quartz and/or beta-spodumene as the principal crystal phase and Ti^{+3} species as a colorant.

4,084,975

VOLATILIZABLE FRIT COMPOSITION FORMING OXIDATION-INHIBITING VAPORS

William D. Faust, Aurora, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 565,452, Apr. 7, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,732

Int. Cl.[2] C03C *5/02*

U.S. Cl. 106—48 **25 Claims**

1. A frit composition adapted to be applied to a metal substrate containing iron and fired to form a ceramic coat, said frit composition comprising (a) in major amount a primary devitrifiable frit composition adapted to fuse at a firing temperature and upon cooling form devitrified particles, and (b) in minor amount a secondary frit composition containing a volatilizable metal oxide adapted to form at a firing temperature a substantially amorphous glass and precipitate crystals of said volatilizable metal oxide partially to volatilize said precipitated crystals at said firing temperature, thereby to provide protective vapors effective to inhibit oxidation of said substrate, and upon cooling to form an amorphous bond adhering said devitrified particles of the primary frit composition one to another, said volatilizable metal oxide being selected from the oxides of antimony, tin, vanadium, molybdenum, lead, arsenic, and mixtures thereof, the combination of said devitrifiable primary and amorphous secondary frit compositions providing a balanced, controlled release of the metallizable metal oxide at the time of firing to extend the protection afforded by the volatilizable metal oxide over a period of time.

4,084,976

LEAD-FREE GLAZE FOR ALUMINA BODIES

Jonathan W. Hinton, Southfield, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed Jul. 20, 1977, Ser. No. 817,194

Int. Cl.[2] C03C *3/08, 5/02*

U.S. Cl. 106—48 **6 Claims**

1. A lead-free ceramic glaze useful for application to high alumina substrates consisting essentially of from 50 to 54 percent by weight SiO_2, from 5 to 8 percent by weight Al_2O_3, from 6 to 12 percent by weight B_2O_3, from 4 to 6 percent by weight CaO, from 2 to 8 percent by weight MgO, from 2 to 15 percent percent by weight BaO, from 5 to 8 percent by weight SrO, from 1 to 2 percent by weight ZnO, and from 4 to 6 percent by weight of a mixture of Na_2O, K_2O and Li_2O.

4,084,977

GLASS AND REFRACTORY FIBRE MATERIALS AND METHOD FOR MAKING SAME

Clive M. Freedman, Littleborough, England, assignor to TBA Industrial Products Limited, Manchester, England

Continuation-in-part of Ser. No. 423,772, Dec. 11, 1973, abandoned. This application Oct. 1, 1974, Ser. No. 511,480

Claims priority, application United Kingdom, Dec. 12, 1972, 57297/72

Int. Cl.[2] C03C *25/00*

U.S. Cl. 106—50 **8 Claims**

1. A glass fibre product consisting of less than 80% by weight SiO_2, from 20 to 25% by weight TiO_2 and not more than about 0.1% by weight of alkali metal oxide.

4,084,978

GLASS FOR EYE GLASS LENS

Hiroji Sagara, Akikawa, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,565
Claims priority, application Japan, Dec. 10, 1975, 50-147098
Int. Cl.[2] C03C *3/08*
U.S. Cl. 106—54 2 Claims

1. A glass for an eye glass lens comprising, in weight percent, 36 to 50% $SiO_2 + Al_2O_3 + B_2O_3$, but with 20 to 50% SiO_2, 0 to 13% Al_2O_3, and 0 to 20% B_2O_3; 5 to 35% CaO + MgO, but with 5 to 35% CaO and 0 to 20% MgO; 1 to 20% $Li_2O + Na_2O + K_2O$, but with 0 to 15% Li_2O and 0 to 15% $Na_2O + K_2O$; 16 to 34% $ZrO_2 + TiO_2 + Nb_2O_5$, but with 0 to 11% ZrO_2, 0 to 3% TiO_2, and 8 to 30% Nb_2O_5; 0 to 15% BaO + SrO + ZnO; and 0 to 15% $La_2O_3 + Ta_2O_5 + WO_3$.

4,084,979

MAGNESIA CERAMIC FOR INSULATION OF HIGH-FREQUENCY ELECTRICITY

Shiro Sano; Hiroshi Hayashi, both of Nagoya, and Hiroyoshi Takagi, Kasugai, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 13, 1976, Ser. No. 749,822
Claims priority, application Japan, Dec. 25, 1975, 50-156172
Int. Cl.[2] C04B *35/04*
U.S. Cl. 106—58 2 Claims

1. A magnesia ceramic for high-frequency electric insulation, consisting essentially of magnesia as the principal component, 2.0 to 20% by weight of a calcium-magnesium-phosphate of the composition xCaO.yMgO.P_2O_5, wherein, x and y each have a value falling within the range of from 0.5 to 2.5; and 0.25 to 5.0% by weight of at least one member selected from the group consisting of the oxides of aluminum, silicon, beryllium and tungsten.

4,084,980

PROCESS FOR PREPARING A FOAMED BODY

Hideo Motoki, Ibaragi, Japan, assignor to Shikoku Kaken Kogyo Kabushiki Kaisha, Japan

Filed Aug. 18, 1976, Ser. No. 715,502
Claims priority, application Japan, Dec. 26, 1975, 50-157139; Dec. 27, 1975, 50-155197; Dec. 27, 1975, 50-158198; Dec. 27, 1975, 50-158199
Int. Cl.[2] C04B *7/00, 21/02*
U.S. Cl. 106—75 14 Claims

1. A process for preparing a foamed body comprising steps of (1) mixing the following four components:

a. an aqueous solution having a pH of up to 2.0 and containing at least one member selected from the group consisting of acids and water-soluble acidic phosphates,

b. at least one member selected from the group consisting of cement materials and anhydrous alkali metal silicates,

c. a metal blowing agent, and

d. a foaming stabilizer

in the proportion of about 10 to about 400 parts by weight of the component (a), 100 parts by weight of component (b) calculated as a metal oxide M_2O or M'O wherein M is alkali metal and M' is alkaline earth metal, about 0.5 to about 30 parts by weight of the component (c) and about 3 to about 50 parts by weight of the component (d), to obtain a pasty mixture, (2) shaping the resulting pasty mixture to a desired shaped mass and (3) leaving the shaped mass to stand to effect foaming, the acids having an electric dissociation constant (pKa) of up to 4.0 at 25° C, the foaming stabilizer being at least one member selected from the group consisting of activated carbon, zeolite, silica gel, carbon black, talc and mica.

4,084,981

QUICK HARDENING CEMENT-ASPHALT COMPOSITION

Yoshiro Higuchi, Higashikurume; Yutaka Harada, Murashino; Toshio Sato, Tokyo; Koji Nakagawa, Asahi; Iwazo Kawaguchi, Tokyo, and Yasushi Kasahara, Sagamihara, all of Japan, assignors to Japanese National Railways; Denki Kagaku Kogyo Kabushiki Kaisha and Toa Doro Kogyo Co., Ltd., all of Tokyo, Japan

Filed Oct. 4, 1974, Ser. No. 512,393
Claims priority, application Japan, Oct. 4, 1973, 48-110958
Int. Cl.[2] C04B *7/356*
U.S. Cl. 106—96 15 Claims

1. A quick hardening cement-asphalt composition used as a grout for a ballast-filled track structure having the following properties:

(1) a compressive strength of about 4 kg/cm^2 within about 60 to 90 minutes after execution,

(2) a consistency of about 5 to 10 seconds with a J funnel (the PC grout test method by the Civil Engineering Society of Japan),

(3) the consistency of (2) above must be maintained for at least 20 minutes after mixing, and

(4) the compressive strength of (1) above must be maintained at temperatures ranging from about 5° C to 35° C, said cement-asphalt composition consisting essentially of

(a) 100 parts by weight of a cement composition prepared by adding to portland cement about 20 to 35% by weight of a mixture of a calcium aluminate-series mineral selected from the group consisting of amorphous $3CaO.Al_2O_3$, amorphous $CaO.Al_2O_3$, amorphous $12CaO.7Al_2O_3$, amorphous $11CaO.7Al_2O_3$, CAF_2 and amorphous $3CaO.3Al_2O_3.CaF_2$ and calcium sulfate in a weight ratio of about 1:0.3 to 1:3; about 0.05 to 10% by weight of an inorganic salt selected from the group consisting of $ZnCl_2$, $AlCl_3$, $CaCl_2$, $MgCl_2FeCl_2$, $NiCl_2$, $CoCl_2$, $MgBr_2$, $[ZnI_2]$ $NaSO_4$, K_2SO_4, $NaNO_2$, $NaNO_3$, KNO_3, KNO_2, $Ca(NO_2)_2$, $Ca(NO_3)_2$, $MgSO_4$, $FeSO_4$, $Al_2(SO_4)_3$, CaB_4O_7, Na_2CO_3, K_2CO_3, $NaHCO_3$, and $KHCO_3$, and about 0.05% to 3% by weight of at least one of an organic carboxylic acid selected from the group consisting of malonic acid, glutaric acid, 1,2,3-propanetricarboxylic acid nitrilotriacetic acid and ethylenediamine tetraacetic acid, an organic hydroxycarboxylic acid selected from the group consisting of malic acid, gluconic acid, citric acid, tartaric acid, salicylic acid, oxymalonic acid and latic acid and a salt thereof, and

(b) about 30 to 400 parts by weight of an asphalt emulsion containing 50 to 65% by weight asphalt, about 0.2 to 8% by weight of a polyoxyethylene alkyl phenyl ether, polyoxyethylene alkyl ether, polyoxyethylene alkyl ester, sorbitan alkyl ester, polyoxyethylene sorbitan alkyl ester or sucrose fatty acid ester nonionic emulsifier and about 0.05 to 2% by weight a multivalent metal chloride, calculated as the multivalent metal ion.

4,084,982

FILLED INORGANIC RESIN CEMENTS AND COMPOSITIONS AND PROCESS FOR FORMING THEM

William L. Prior, Newark, Ohio, and Richard S. Lindstrom, Reading, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Dec. 3, 1976, Ser. No. 747,219
Int. Cl.[2] C04B *9/02, 9/04*
U.S. Cl. 106—105 37 Claims

1. A filled inorganic resin cement, comprising in combination

(a) a magnesium oxide cement which is the reaction product of active MgO and an aqueous, soluble phosphate-containing slurry of a magnesium salt selected from the group consisting of $MgCl_2.6H_2O$ and $MgSO_4.7H_2O$, the concentration of said magnesium salt in said slurry prior to reac-

tion with said MgO being between about 60% and 80% by weight, the molar ratio of $MgCl_2.6H_2O$ to MgO ranging between about 1 to 3 and about 1 to 9 and of $MgSO_4.7H_2O$ to MgO ranging between about 1 to 3 and about 1 to 14, said reaction product being further characterized in that essentially all of the water of said slurry and the water of hydration of said magnesium salt are consumed in the reaction and are contained in said reaction product; and

(b) a multidirectional, microfiber filler blended into said slurry subsequent to the addition of said MgO thereto and distributed throughout said cement, said filler being present in an amount ranging from about 2% to about 40% by weight of said magnesium oxide cement.

4,084,983

DYED LUSTROUS PIGMENTS

Horst Bernhard, and Kürt Marquard, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Jun. 19, 1975, Ser. No. 588,504
Claims priority, application Germany, Jun. 21, 1974, 2429762
Int. Cl.² C04B *31/38, 31/00;* B05D *7/00*
U.S. Cl. 106—289 **21 Claims**

1. In a colored lustrous pigment composition comprising translucent micaceous flakes coated with a dyestuff, the improvement wherein said dyestuff is an aluminum lake fixed onto the surface of the micaceous pigment by a smooth and uniform intermediate coating of aluminum hydroxide, the aluminum of said aluminum hydroxide being a chemically bound portion of said aluminum lake, the pigment composition being substantially devoid of agglomerated flakes and being substantially color fast.

4,084,984

TEMPERATURE-STABLE INORGANIC YELLOW PIGMENTS

Franz Hund, Krefeld-Bockum; Wilhelm Holznagel; Henning Erfürth, both of Krefeld; Friedrich Kindervater, Leverkusen, and Willi Hennings, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1974, Ser. No. 497,366
Claims priority, application Germany, Aug. 30, 1973, 2343704
Int. Cl.² C09C *1/36*
U.S. Cl. 106—300 **6 Claims**

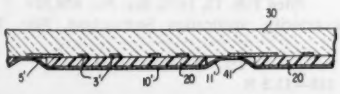
1. A temperature-stable inorganic yellow pigment of the composition $Fe_2TiO_5 . x\ TiO_2$, where x is from about 0.5 to about 10, with a particle diameter of less than about 1 micron.

4,084,985

METHOD FOR PRODUCING SOLAR ENERGY PANELS BY AUTOMATION

John C. Evans, Jr., North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,637
Int. Cl.² H01L *31/04, 31/18*
U.S. Cl. 136—89 P **21 Claims**



1. A method of fabricating an integral solar cell panel containing a multiplicity of solar cells, which comprises:

forming an etched pattern of a multiplicity of solar cell collector grid systems with accompanying interconnection and bus bar tabs into a transparent, environmentally stable protective sheet;

depositing a layer of conductive metal into the etched regions of said protective sheet followed by a layer of a transparent conductive mixed metal oxide or metal oxide;

forming a pattern of conductive areas with accompanying interconnection and bus bar tabs corresponding to the collector grid systems and interconnection and bus bar tabs of said protective sheet on a substrate as a backelectrode for said solar cell panel; and

bonding a multiplicity of solar cells between said protective sheet and said backelectrode substrate such that the position of said cells in the fabricated panel correspond to the positions of said collector grid systems on said protective sheet and the conductive areas on said backelectrode substrate.

15. An integral solar cell panel containing a multiplicity of solar cells, which comprises:

a protective sheet having collector grid systems, interconnection and bus bar tabs etched into one surface thereof wherein the etched regions contain a first thin film of conductive metal and a superposed layer of transparent, conductive mixed metal oxide or metal oxide;

a backelectrode substrate having conductive areas corresponding to said collector grid systems and interconnection and bus bar tabs of said protective sheet; and

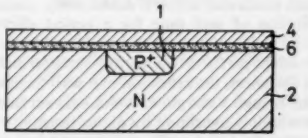
a multiplicity of solar cells sandwiched between and in conductive adhesive contact with said protective sheet and backelectrode substrate such that said cells are positioned between the mutually opposing collector grid system of said protective sheet and the conductive areas of said backelectrode substrate and such that mutually opposing interconnection and bus bar tabs on said protective sheet and backelectrode substrate are in firm contact in order to form a complete electrical network of said cells in said panel.

4,084,986

METHOD OF MANUFACTURING A SEMI-INSULATING SILICON LAYER

Teruaki Aoki, Tokyo; Takeshi Matsushita, Sagamihara; Tadayoshi Mifune, Yokohama, and Hisao Hayashi, Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 19, 1976, Ser. No. 678,061
Claims priority, application Japan, Apr. 21, 1975, 50-48378
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **18 Claims**



1. A method of manufacturing a semiconductor device which includes implanting one of a group consisting of oxygen and nitrogen in a silicon layer, the implantation being continued until said layer has been converted into a semi-insulating layer having a resistivity of 10^7 to 10^{11} ohm-cm.

4,084,987
METHOD FOR MANUFACTURING ELECTRICAL SOLID STATE DEVICES UTILIZING SHADOW MASKING AND ION-IMPLANTATION

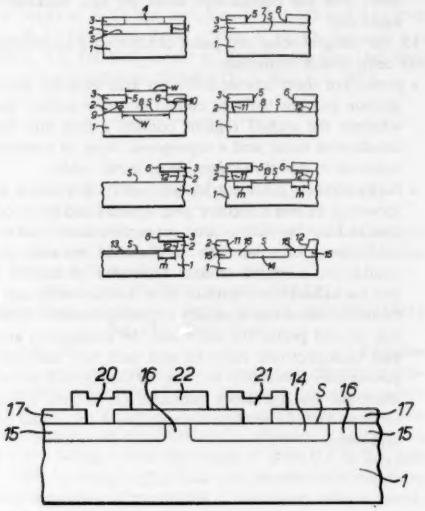
Geoffrey Allan Godber, Long Buckby, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Sep. 27, 1976, Ser. No. 726,796

Claims priority, application United Kingdom, Sep. 27, 1975, 39669/75

Int. Cl.[2] H01L *21/265, 21/31*

U.S. Cl. 148—1.5 3 Claims



1. A method of manufacturing an electrical solid state device having a stratum presenting a surface at which the stratum is to be subjected to an implantation treatment, which method comprises the steps of:

(i) forming a film on the said surface, the material of the film being doped with ions of a substance to be diffused in the stratum;

(ii) covering the film with a layer of a photo-resist;

(iii) photographically exposing a trace of at least one channel on the layer, and removing the exposed resist from the trace to leave at least one channel having walls constituted by defined edges of photo-resist and a floor of film material;

(iv) forming a trough in the film material by introducing an etchant into each channel whereby an etching action is started on the film material at the floor of the said channel, which action continues through the film thickness until such time as said surface is exposed over a width equal to the width between said defined edges, an incidental action taking place during this time at the walls of the trough which incidental action is deliberately continued after the expiration of said time for a period during which the trough walls are caused to recede and to assume a profile dependent partly on the period duration and partly on the film thickness, the recession of a wall forming at the floor of the trough a margin at which said surface is uncovered and which is overhung by photo-resist;

(v) bombarding said surface, from a source above the said surface and the photo-resist, with ions of a substance to be implanted in the stratum, whereby the uncovered nonoverhung stratum undergoes implantation by the bombarding ions; and

(vi) heating the stratum and the surviving film material whereby, firstly ions of the dopant substance are transferred from the film material to the stratum and are implanted therein, and secondly ions, implanted either by bombardment or by transfer, are caused to diffuse into the stratum except at said margin where no implanted ions will be present, thereby forming in the stratum a number of individual diffusions of the same type, any two of which are separated from each other by a boundary wall of stratum material whose width of is the width of a margin.

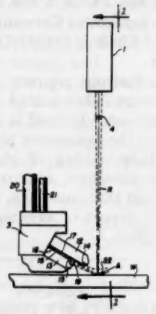
4,084,988
METHOD AND APPARATUS FOR MAKING INSTANTANEOUS SCARFING CUTS

Stephen August Engel, Shenorock, and Ronald Elmer Fuhrhop, Suffern, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 684,833, May 10, 1976, Pat. No. 4,038,108. This application Apr. 25, 1977, Ser. No. 789,720

Int. Cl.[2] B23K *7/06, 7/08*

U.S. Cl. 148—9.5 10 Claims



1. A method for making an instantaneous scarfing cut on the surface of a metal workpiece, comprising the steps of:

(a) causing relative motion between the workpiece and a stream of scarfing oxygen gas, and simultaneously therewith

(1) impinging at least one laser beam on the work surface so as to produce a heated path of desired length across said surface, relative to its direction of motion, said heated path being produced by the laser beam heating a series of points on said surface to their oxygen ignition temperature, and

(2) impinging a stream of scarfing oxygen onto said heated path, thereby causing an instantaneous scarfing cut to begin along said path, and

(b) continuing the flow of scarfing oxygen until the desired length of cut has been produced.

4,084,989
METHOD FOR PRODUCING A STABILIZED ELECTRICAL SUPERCONDUCTOR

Gundolf Meyer, Birmenstorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 13, 1976, Ser. No. 658,024

Claims priority, application Switzerland, Mar. 12, 1975, 3103/75

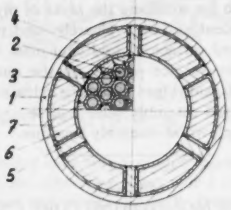
Int. Cl.[2] H01L *39/14*

U.S. Cl. 148—11.5 R 4 Claims

1. The method for producing a stabilized superconductor containing a plurality of thin filaments of superconductive material which comprises the steps of:

mechanically working a composite parent slug to achieve intimate metallic connection between the individual abutting constituents of the slug to form a relatively thin composite conductor structure, the middle region of the cross-section of said conductor structure including a plurality of

mutually spaced filaments consisting of a first superconductor-forming material surrounded by a second material which permits radially inward diffusion of a third material therethrough into said first material to convert the latter into stabilized superconductor filaments, the radially outer region of said conductor structure including a plurality of mutually spaced conductors of a fourth material having a good electrical conductivity characteristic and each of which is covered by a layer of a fifth material forming a barrier against penetration of said diffusible third material, a sixth material which permits radially inward diffusion of



said third material disposed between the diffusion barriers formed on at least some of said conductors of good electrical conductivity characteristic, and outer material which also permits radially inward diffusion of said third material and which surrounds said conductors having a good electrical conductivity characteristic;

applying a layer of said third material to said outer material; and

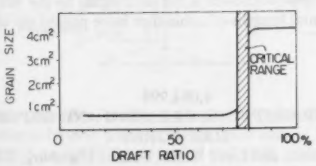
effecting by heat treatment diffusion of said third material radially inward through said outer material and said sixth and second materials into said first filamentary material to convert the latter into superconductors.

4,084,990

PROCESS FOR FABRICATION OF DECORATIVE PANEL

Kisuke Watanabe, Tokyo, and Tsuneji Takasugi, Iruma, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,600
Claims priority, application Japan, Dec. 26, 1975, 50-157167
Int. Cl.[2] C22F *1/02, 1/08, 1/14*
U.S. Cl. 148—11.5 R **11 Claims**



1. A method of forming a coarse, enlarged crystalline pattern on a metal sheet which comprises the steps of: (a) rolling the metal sheet at a draft ratio in excess of a critical draft ratio peculiar to the metal sheet; and (b) annealing the metal sheet in an anti-oxidizing atmosphere at a first predetermined temperature in excess of a recrystallization temperature to allow coarse, enlarged crystals to form.

4,084,991

ENAMELED COLD ROLLED SHEET

Kazuo Matsudo; Takayoshi Shimomura, and Teruo Kurokawa, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 583,879, Jun. 5, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,840
Claims priority, application Japan, Jul. 10, 1974, 49-78190
Int. Cl.[2] C22C *38/04*
U.S. Cl. 148—31.5 **7 Claims**

1. An enameled cold rolled steel sheet, comprising:

(i) a ferrous enameling sheet and characterized by substantially constant manganese content of up to 0.50 weight percent to a depth of about 5 μ from the surface thereof, said sheet being produced by cold rolling a steel sheet having a manganese content of up to 0.50 weight percent to cold reduction ratio of more than 30 percent, and

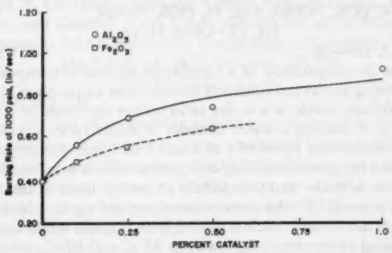
(ii) an enamel coating on the surface of said ferrous enameling sheet, said enamel coating having been applied immediately after cold rolling without an intermediate anneal.

4,084,992

SOLID PROPELLANT WITH ALUMINA BURNING RATE CATALYST

James O. Hightower; James W. Hamner, and Richard L. Matthews, all of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Apr. 22, 1976, Ser. No. 679,101
Int. Cl.[2] C06B *45/08*
U.S. Cl. 149—17 **4 Claims**



1. A solid propellant composition which comprises as essential ingredients a binder component, a perchlorate oxidizer component, and from 0.5% to 2% of finely divided aluminum oxide, said aluminum oxide having a total surface area of from 40 to 160 square meters.

4,084,993

STABLE BLASTING SLURRY

Melvin A. Cook, 2026 Beneficial Life Tower, The ZCMI Center, 36 S. State St., Salt Lake City, Utah 84111

Continuation-in-part of Ser. No. 705,593, Jul. 15, 1976, abandoned. This application Sep. 24, 1976, Ser. No. 726,300
Int. Cl.[2] C06B *36/10*
U.S. Cl. 149—39 **44 Claims**

1. A stable blasting slurry having prolonged stability resulting from the process comprising mixing followed by rapid cooling of a hot (40° to 70° C), guar-gum thickened (by up to 0.5% guar gum) oxidizer liquid with a hot (also 40° to 70° C) fuel liquid fortified with up to 10% dispersing or emulsifying agent and said fuel liquid being either a fuel sensitizer in itself or containing a dissolved or suspended fuel sensitizer dispersed in a liquid carrier, or both, the resulting mixture being gelled by means of a cross-linking agent for guar gum in an amount up to 20% of guar gum thickener content, the stable blasting slurry being density controlled by means of pre-determined quantity of foaming or gassing agent or a low-density porous solid, with the proviso that the aforesaid fuel liquids are limited

to those having melting points at least 10° C higher than ambient temperatures.

4,084,994

AQUEOUS HYDROCARBON OIL-SOLUBLE LIGNOSULPHONATE EXPLOSIVE COMPOSITION

Tore Bernt Nielsen, and Oddvar Alm, both of Drammen, Norway, assignors to Dyno Industrier A.S., Oslo, Norway

Continuation-in-part of Ser. No. 624,284, Oct. 20, 1975, abandoned. This application Dec. 30, 1976, Ser. No. 755,555
Claims priority, application Norway, Mar. 14, 1975, 750887
Int. Cl.² C06B *33/02*
U.S. Cl. 149—44 **7 Claims**

1. In an aqueous explosive composition which comprises at least one inorganic oxygen-supplying salt, at least one fuel and at least one thickener, the improvement according to which the composition has a water content of from 5 to 15% by weight, a content of not less than 3% by weight hydrocarbon oil and from 0.5 to 5.0% by weight of a water soluble lignosulphonate, said composition being free from self-explosive matter, nitroderivatives, nitric acid esters and chlorinated hydrocarbons.

4,084,995

PREPARATION OF A CAP SENSITIVE PARTICULATE EXPLOSIVE COMPOSITION COMPRISING CALCIUM NITRATE

Eirik Samuelsen, Lierbyen, and Oddvar Alm, Drammen, both of Norway, assignors to Dyno Industrier A.S., Oslo, Norway

Filed Sep. 20, 1976, Ser. No. 725,127
Claims priority, application Norway, Sep. 19, 1975, 753212; Jun. 14, 1976, 762043; Aug. 16, 1976, 762824
Int. Cl.² C06B *31/42*
U.S. Cl. 149—56 **15 Claims**

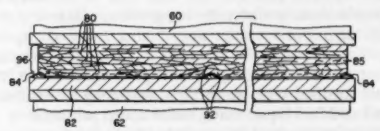
1. In the preparation of a particulate explosive composition comprising as oxygen releasing components ammonium nitrate and calcium nitrate in a molar ratio within the limits of 50 to 1 and 4 to 1, having a water content in molar ratio to calcium nitrate within the limits of 4 to 1 and 1 to 1, and comprising at least one oxygen consuming component which is substantially insoluble in water and completely or partly liquid at temperatures above 35° C, the improvement according to which ammonium nitrate and calcium nitrate with the said water content are heated to temperatures between 35° C and 80° C, whereafter the nitrate mixture is cooled under sustained mechanical agitation to below 35° C to produce a free-flowing particulate matter, during which heat treatment the oxygen consuming component(s) is (are) added, prior to or during the final cooling period.

4,084,996

METHOD OF MAKING A GROOVED, FIBER-CLAD PLYWOOD PANEL

Robert G. Wheeler, Corvallis, Oreg., assignor to Wood Processes, Oregon Ltd., Corvallis, Oreg.

Continuation-in-part of Ser. No. 488,274, Jul. 15, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,552
Int. Cl.² B27D *1/08*; B32B *31/20*
U.S. Cl. 156—257 **13 Claims**



2. The method of making a plywood panel having a grooved, fiber-clad surface including the steps:

rough machining a metal caul plate so as to produce a rough, jagged, textured surface on the upper side of said plate,

forming a plurality of parallel ridges comprising weld beads on said upper surface of said caul plate about one-eighth inch high with converging, rough-surfaced opposite said walls adjacent said upper side of said plate,

vacuum-forming a spongy, cellulosic, fibrous, pulp web from a slurry of cellulosic fibrous pulp and including a thermo-setting resinous material,

juxtapositioning said web and a plywood assembly,

assembling said caul plate and said web and the plywood assembly with said ridged surface of the caul plate next adjacent said web,

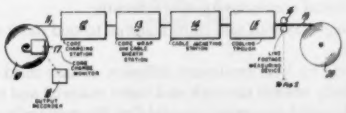
and compressing said caul plate in a hot press under sufficient heat and pressure against said web and plywood assembly to cause steam to be formed due to the moisture from said web for softening the layer of plywood assembly next adjacent said web whereby said ridges and the jagged textured surface of said caul plate will emboss a complementary surface pattern on the outer surface of said web, with said ridges becoming releasably embedded in said plywood assembly, and will securely bond said web and the plywood assembly together.

4,084,997

APPARATUS FOR MONITORING CORE CHARGING OF WATERPROOF COMMUNICATION CABLE

Merle C. Biskeborn, Chatham, N.J., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,155
Int. Cl.² B05B *1/00*
U.S. Cl. 156—356 **5 Claims**



1. Apparatus for continously monitoring the charging with filling compound of a cable core of predetermined total length and comprising a plurality of twisted pairs, the apparatus comprising:

means for continously charging with filling compound successive incremental lengths of cable core passing said charging means;

means connected to one end of a first of the plurality of twisted pairs for continously sensing, as the successive incremental lengths of the core are charged, the mutual capacitance of that first twisted pair; and

means associated with the sensing means for continously comparing the sensed mutual capacitance of the first twisted pair with a value representing the mutual capacitance of a twisted pair in the core of a cable of the same total length which has been completely charged with filling compound over a distance equal to the sum of the incremental lengths of cable that have passed the charging means.

4,084,998

DEVICE FOR GRIPPING, PRESSING AND DEPOSITING TIRE CORES

Werner Eichholz, and Gerd Krebs, both of Hamburg, Germany, assignors to Phoenix Gummiwerke AG, Hamburg, Germany

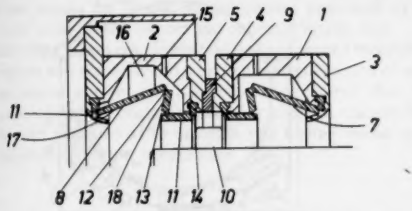
Filed Apr. 14, 1976, Ser. No. 676,987
Claims priority, application Germany, Jun. 5, 1975, 2525038
Int. Cl.² B29H *17/22*
U.S. Cl. 156—403 **10 Claims**

1. A device for gripping, pressing and depositing tire cores upon a raw tire blank, comprising:

an axially shiftable supporting cylinder including two rings located side-by-side, each of which has a single inner

annular trough parallel to the trough located in the adjacent ring; and

two separate rings, each of which airtightly covers one of said troughs and includes a plurality of spaced, annularly-extending grooves formed therein which define annular zones separated by articulated joints and which permit pivotal movement of said annular zones in a toggle-like manner with respect to each other, said grooves formed in



one ring being reversely arranged relative to the grooves formed in the other ring to provide a mirror-like symmetry between said rings, and each of said rings having an inner axially adjacent annular zone which, under the influence of fluid pressure, is inwardly swingable toward the inner annular zone of the other ring to provide a tong-like movement facilitating the gripping of a bead core between the two adjacent inner annular zones of said two rings.

4,084,999

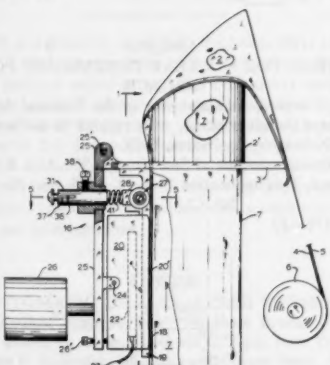
APPARATUS FOR FORMING CONTAINERS WITH FIN-TYPE SEAMS

George I. Rucker, Dublin, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of Ser. No. 327,476, Jan. 29, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,664

Int. Cl.[2] B29D *23/10;* **B32B** *1/08*

U.S. Cl. 156—466 **5 Claims**



1. In apparatus for forming a continuous tube of bag forming sheet material having a heat sealable inner face of heat sealable material and an outer face free of said heat sealable material and which is continuously moved in an axial direction and while thus moved the heat sealable inner faces along the opposite edges of the sheet are heat sealed into a fin-type seam wherein one edge portion of the sheet is folded back over the body of the tube along a fold line and the opposite edge portion of the sheet overlaps the folded edge portion, and wherein a heat sealing die is provided to heat seal said edge portions together the improvement comprising an elongated, rigidly mounted back-up plate having a smooth back-up surface and an elongated free edge disposed in said axial direction, means for continuously moving and folding said one edge portion of said sheet over said back-up plate with the outer face of said one edge portion engaging said smooth back-up surface of said back-up plate while simultaneously lapping the opposite edge portion of the sheet over said folded edge portion and with said fold line adjacent to the elongated free edge of said back-up plate whereby said back-up plate is located between said folded edge portion and the outside face of the body of the tube, means for pressing said heat sealing die against said overlapped portion while maintaining the outer face of the folded edge portion in sliding engagement with said smooth back-up surface of said back-up plate with the folded edge portion inner face out of engagement with said back-up plate so no scuffing occurs therebetween while the seam is continuously being moved to thus heat seal the seam, a tracking wheel positioned upstream from said heat sealing die in engagement with the outside face of the overlapped edge portion of said seam before the seam is heat sealed to press the seam against the back-up plate and which is mounted for rotation about an axis transverse to the tube axis at a predetermined angular position to apply a pulling force on said seam in a direction toward the edge of the seam and thus oppose drifting of the seam in a direction toward said fold line, and means for maintaining the tracking wheel in such engagement.

4,085,000

METHOD OF RECOVERING TALL-OIL SOAP FROM KRAFT BLACK LIQUOR

Joseph V. Otrhalek, Dearborn; Gilbert Stephen Gomes, Southgate, and Gunther Hans Elfers, Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 13, 1977, Ser. No. 759,070

Int. Cl.[2] D21C *11/00*

U.S. Cl. 162—16 **8 Claims**

1. A method of recovering tall-oil soap from a black liquor from a sulfate kraft pulping step, produced in the pulping of wood from a coniferous tree, said method comprising mixing with said liquor about 10 to 500 parts by weight, per one million parts by weight of said liquor, of a terpolymer consisting essentially of units which are:

(a) about 60 to about 88 parts by weight from an alpha-beta-unsaturated acid containing 3 to 4 carbon atoms,

(b) about 6 to about 28 parts by weight from an alkylate of an alpha-beta-unsaturated acid containing 3 to 4 carbon atoms, the alkyl portion of said alkylate containing from 1 to 18 carbon atoms, and

(c) about 4.5 to about 20 parts by weight from allyl alcohol and thereafter recovering the said tall-oil soap from said liquor.

4,085,001

FIBER REINFORCED CEMENTITIOUS SUBSTRATE

Tadashi Fukuwatari, Tokyo; Kiyotaka Mishima, Kawasaki; Hiroshi Ichimura, Ichikawa, and Hideaki Kurihara, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Jun. 30, 1976, Ser. No. 701,220

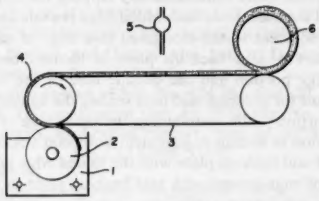
Claims priority. application Japan, Jul. 11, 1975, 50-84416; Jul. 18, 1975, 50-87218

Int. Cl.[2] D21F *11/02, 11/06;* **B28B** *1/26*

U.S. Cl. 162—145 **12 Claims**

1. A process for preparing a glass fiber-reinforced cement sheet which comprises dewatering a cement-containing slurry on a wire to form a wet film and winding said wet film on a making roll; the improvement which comprises utilizing in the process an aqueous, cement-containing slurry having a solid content of from 2–30 wt% and wherein the solid component of said slurry comprises 1 to 10 wt% glass fibers, and at least one

member selected from the group consisting of 1 to 10 wt% asbestos and 0.03 to 5 wt% of a specific fiber wherein said



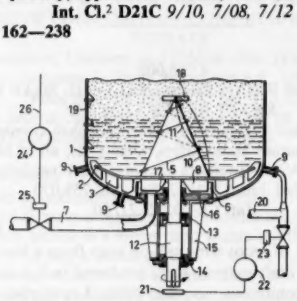
specific fiber is selected from the group consisting of cotton, flax, hemp, wools and silk with the remainder cement material.

4,085,002

BLEACHING TOWER FOR GAS PHASE BLEACHING

Bengt Edvard Pettersson, Sundsvall, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Dec. 20, 1973, Ser. No. 426,437
Claims priority, application Sweden, Jan. 5, 1973, 7300147
Int. Cl.[2] D21C *9/10, 7/08, 7/12*
U.S. Cl. 162—238 **11 Claims**



1. In a bleaching tower for gas-phase bleaching preferably oxygen bleaching at high consistency of finely disintegrated gas-pervious fibrous material such as cellulose pulp, said bleaching tower being substantially vertical and providing in the upper portion thereof a gas zone with an inlet for the fibrous material above a space for a column of fibrous material of high consistency, 18–40%, suitably 25–35%, said column space overlying a dilution space in the lower portion of the tower with supply conduits for dilution liquid and a discharge outlet for treated fibrous material, there being a mixing space between said column and said dilution space, the improvement which comprises inlets (**9**) for the dilution liquid being located in the wall of the tower close to the bottom thereof.

a hub body (**4**) located centrally at the bottom of the tower on a shaft (**12**);

a driving means for rotation of said shaft, said hub body having an upwardly narrowing cross-section and a base diameter which is at least a fourth of the diameter of the tower at the level of the hub body, said hub body extending upwards at least somewhat into the mixing space and being provided with screw-shaped means (**5**) for guiding the material downwards, means for stirring and conveying the material to a discharge outlet (**7**) located in the bottom of the tower, and means for causing an additional torque to the torque required for rotating the hub body;

a transmitter (**21**) connected to the driving means for the hub body shaft, said transmitter controlling the supply of dilution liquid to said dilution space in relation to the torque by means of a valve means (**23**) in order to keep the height of the dilution space constant; and

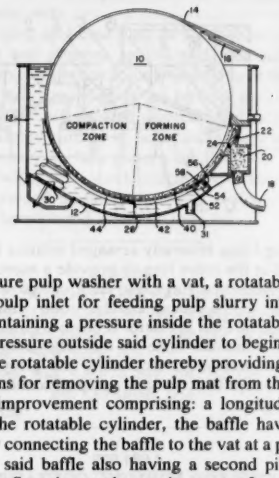
means arranged to maintain the height of a column of fibrous material in said tower.

4,085,003

PRESSURE PULP WASHER WITH PIVOTED BAFFLE

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 18, 1977, Ser. No. 779,146
Int. Cl.[2] D21F *1/04, 1/60*
U.S. Cl. 162—259 **3 Claims**



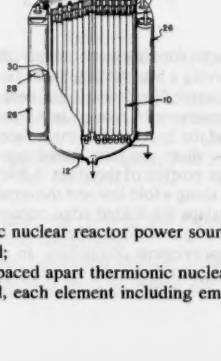
1. In a pressure pulp washer with a vat, a rotatable cylinder in the vat, a pulp inlet for feeding pulp slurry into the vat, means for maintaining a pressure inside the rotatable cylinder less than the pressure outside said cylinder to begin forming a pulp mat on the rotatable cylinder thereby providing a forming zone, and means for removing the pulp mat from the rotatable cylinder, the improvement comprising: a longitudinal baffle spaced from the rotatable cylinder, the baffle having a first pivot pivotally connecting the baffle to the vat at a point in the forming zone, said baffle also having a second pivot downstream from the first pivot and actuating means for applying an actuating force aginst the radial outside surface of the baffle, at a predetermined circumferential point downstream from the second pivot thereby providing a compaction zone downstream from the second pivot, said actuating means being positioned so that the baffle will automatically adjust in response to changes in thickness of the mat to provide the correct convergence angle.

4,085,004

CONTROL FOR NUCLEAR THERMIONIC POWER SOURCE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Craig D. Sawyer, Los Gatos, Calif.

Continuation-in-part of Ser. No. 294,738, Oct. 3, 1972, abandoned. This application Nov. 21, 1975, Ser. No. 634,214
Int. Cl.[2] G21C *7/00*
U.S. Cl. 176—22 **6 Claims**



1. A thermionic nuclear reactor power source comprising:

a reactor vessel;

a plurality of spaced apart thermionic nuclear fuel elements in said vessel, each element including emitter means and

collector means spaced apart from said emitter means and nuclear fuel means, said nuclear fuel means generating neutrons to heat said emitter means at a controllable neutron flux in said vessel;

means electrically coupled to said emitter and collector means of said elements for supplying current therefrom to a load;

control means for controlling the neutron flux in said vessel;

first means for measuring the neutron flux in said vessel;

second means for measuring the current generated by at least some of said emitter and collector means; and

controlling means coupled to said first and second measuring means and responsive to a predetermined function of said measured current and said measured neutron flux for controlling said control means to control the neutron flux in said vessel so as to maintain said emitter means at a relatively constant temperature.

4,085,005

METHOD OF PREPARATION OF INSOLUBLE BIOLOGICALLY ACTIVE COMPOUNDS

Miroslav Bleha; Eva Votavová, and Zdeněk Plichta, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

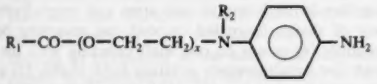
Filed Mar. 24, 1976, Ser. No. 669,866

Claims priority, application Czechoslovakia, Mar. 27, 1975, 2132/75

Int. Cl.² C07G 7/02

U.S. Cl. 195—68 **8 Claims**

1. A method of insolubilizing a soluble biologically active compound, which comprises providing an alkaline aqueous medium containing (1) a polymeric material having p-phenylenediamine reactive sites according to the general formula:



wherein R_1 is a polymer residue, R_2 is a lower alkyl group, and x is 1 to 4, and (2) a soluble biologically active compound having a primary amino group; and oxidatively coupling the amino group of said soluble biologically active compound to the polymeric material by means of oxidizing said reactive sites with an agent that does not affect the biological activity of the biologically active compound and which is selected from the group consisting of alkali metal arsenates, ferricyanides, quinone, oxygen together with cupric ions, a cupric ammonium complex and hydroquinone.

4,085,006

AUTOMATIC CELL ANALYZER METHOD

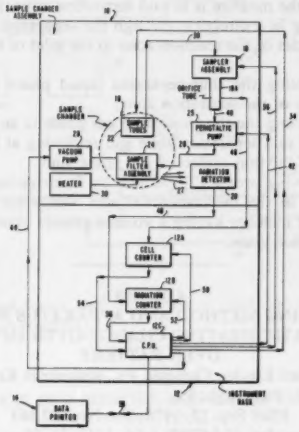
Leo R. Mindick, Flushing, N.Y.; Avraham Bruck; Dan Inbar, both of Haifa, Israel, and Leopold G. Koss, New York, N.Y., assignors to Isomedics, Incorporated, Great Neck, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,518

Int. Cl.² C12K 1/00, 9/00

U.S. Cl. 195—103.7 **3 Claims**

1. A method for analyzing cells for determination of cell character, comprising the steps of selecting a sample of cells, placing the cells in a fixative solution to form a suspension, ultrasonicating the cells under conditions to achieve dispersion of cells without disrupting cell membrane integrity, incorporating in the suspension a radioactive biochemical which attaches to at least a portion of the cells, counting a pre-determined number of cells withdrawn from the radioactive suspension, depositing said counted cells at a draining location, transporting said counted and drained cells to a drying location and to a radioactive detection location, performing a radioactive count on said cells at said radioactive detection location and comparing said radioactive count in normalized form with a



pre-determined setting to evaluate said sample to determine the character of said cells.

4,085,007

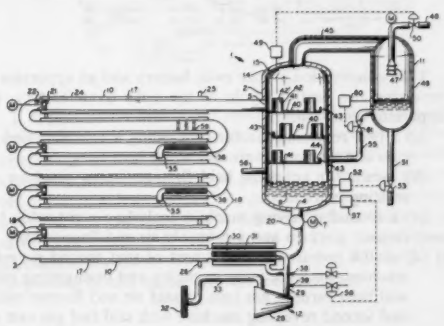
METHOD AND APPARATUS FOR CONDUCTING FERMENTATION

Harold M. Hawkins, deceased, late of Bartlesville, Okla. (by Marjorie Wood Hawkins, executrix), assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 545,547, Jan. 30, 1975, Pat. No. 3,985,622. This application Apr. 15, 1976, Ser. No. 677,209

Int. Cl.² C12B 1/14

U.S. Cl. 195—109 **8 Claims**



1. A method for effecting microbial growth by a fermentation process comprising:

(a) introducing fermentation medium into a reaction zone defined by a tubular member consisting of a plurality of generally horizontally disposed tubular portions connected in flow communication by at least one interconnecting member and each said tubular portion forming a substantially horizontal flow path portion of a flow path where a major portion of the reaction zone is disposed generally horizontally;

(b) flowing said medium through said reaction zone from an inlet to an outlet during which a majority of the fermentation is conducted;

(c) injecting an oxygen-containing gas into said medium when same is in said reaction zone;

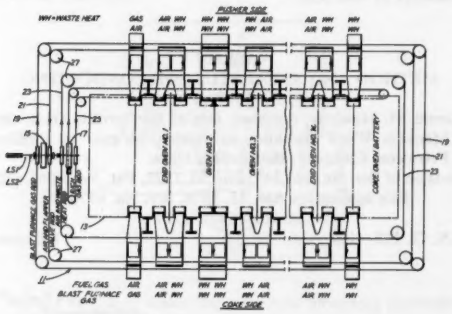
(d) discharging said medium from said outlet into a separation zone at a position above said inlet;
(e) separating a gas phase from a liquid phase of said medium when the medium is in said separation zone, the medium flowing in a direction through the separation zone from the outlet of the reaction zone to the inlet of the reaction zone;
(f) collecting the thus separated liquid phase in a lower portion of the separation zone;
(g) collecting the thus separated gas phase in an upper portion of said separation zone and removing at least a portion of the thus collected gas phase; and
(h) removing product, produced by fermentation and contained in the medium, from said separation zone, said tubular member having a volume greater than that of the separation zone.

4,085,008

REVERSING METHOD AND APPARATUS FOR THE AUTOMATIC HEATING CHANGE-OVER OF A COKE OVEN BATTERY

Raymond Carl Kinzler, Carnegie, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sep. 15, 1976, Ser. No. 723,461
Int. Cl.[2] C10B *1/06, 5/12, 21/16*
U.S. Cl. 202—151 **10 Claims**



1. In combination,a coke oven battery and an apparatus for reversing the heating cycle of the coke oven battery, said apparatus comprising:
(a) a first reversing machine including a rotatable fuel gas cam and a rotatable air and waste heat cam;
(b) means for actuating said first reversing machine and rotating said cams;
(c) a second reversing machine including a rotatable blast furnace gas cam and a rotatable air and flapper cam;
(d) clutch means, forming a part of said second reversing machine, for selectively engaging and disengaging either said blast furnace gas cam or said air and flapper cam of said second reversing machine with said fuel gas cam and said air and waste heat cam of said first reversing machine;
(e) means for moving said clutch means into and out of selective engagement with either said blast furnace cam or said air and flapper cam;
(f) means for locking in a fixed position one of either of said blast furnace gas cam or said air and flapper cam as the other of these cams is driven by said clutch means engaged with said one cam and said rotating cams of said first reversing machine;
(g) a fuel gas rod coacting with said fuel gas cam;
(h) an air and waste heat rod coacting with said air and waste heat cam;
(i) a blast furnace gas rod coacting with said blast furnace gas cam;
(j) an air and flapper rod coacting with said air and flapper cam;
(k) a plurality of gas or air and waste heat reversing boxes, fixed to said coke oven battery, each including (1) a first shaft journaled to said box, (2) a second shaft journaled to said box, (3) a first lid pivotally secured to said second shaft, (4) a third shaft journaled to said box, (5) a second lid pivotally secured to said third shaft; (6) means interconnecting said second and said third shafts for the simultaneous rotation of said second and third shafts, (7) means integrating rotation of said first shaft with rotation of said second and third shafts, (8) a first lever fixed to said first shaft and connected to said air and flapper rod whereby linear movement of said air and flapper rod causes said first lever to pivot said first shaft which causes said second shaft and said third shaft to pivot simultaneously, said integrating means being so arranged that at one time during said heating cycle said lids are closed and said lids remain closed until said air and flapper rod is moved under the influence of said second reversing machine, (9) a pair of waste heat valves, (10) a pair of valve shafts pivotally mounting said waste heat valves to each said air and waste heat reversing box, (11) a second lever pivotally coacting with said pair of valve shafts and connected to said air and waste heat rod, whereby linear movement of said air and waste heat rod causes said second lever to pivot said valve shafts simultaneously to open said waste heat valves, said movement of said air and waste heat rod being coordinated by said clutch means of said second reversing machine with said movement of said air and flapper rod such that said waste heat valves are opened as said lids are closed and said waste heat valves are closed as said lids are opened when said coke oven is operating on rich fuel gas, and (12) means coacting with said lids to regulate air flow into said gas or air and waste heat reversing box;
(l) a plurality of blast furnace gas reversing boxes each flow coordinated to said gas or air and waste heat reversing box, each containing (1) a pair of shut-off valves, (2) an arm mounted to pivot each said shut-off valve, (3) a toggle linkage comprising a pair of links pivotally connected together to each one of said arms and respectively to a pair of shafts, journaled on said gas reversing box for rotation, (4) means on one shaft coacting with the other shaft for simultaneously rotating both shafts, (5) a lever pivotally fixed to one of said shafts and connected to said blast furnace gas rod whereby linear movement of said blast furnace gas rod causes said lever to pivot said pair of shafts to open and close said shut-off valves, said movement of said blast furnace gas rod being coordinated by said clutch means of said second reversing machine with said movement of said air and waste heat rod such that said lids on said air and waste heat reversing boxes are opened as said shut-off valves are opened and said lids on said air and waste heat reversing boxes are closed as said shut-off valves are closed when said coke oven is operating on blast furnace gas or a mixture of blast furnace and rich fuel gases, (6) a pair of internal valves coordinated to open and close with said shut-off valves, and (7) means for operating said internal valves cooperating with said pair of shafts;
(m) a plurality of air and waste heat reversing boxes, each fixed to said coke oven battery at a point between two of said plurality of said gas or air and waste heat boxes with corresponding said flow coordinated blast furnace gas reversing boxes such that said air and waste heat reversing boxes alternate with said gas or air and waste heat boxes with corresponding said flow coordinated blast furnace gas reversing boxes, each said air and waste heat reversing box including (1) a first lid, (2) a first shaft pivotally mounting said first lid to said air and waste heat reversing box, (3) a second lid, (4) a second shaft pivotally mounting said second lid to said air and waste heat reversing box, (5) connecting means between said first shaft and said second shaft which pivots said first lid open as said second lid is closed and pivots said first lid closed as said second lid opens, (6) a lever pivotally fixed to either said first shaft or said second shaft and connected to said air and waste heat

rod whereby linear movement of said air and waste heat rod causes said lever to pivot said first shaft and said second shaft simultaneously such that either said first lid closes and said second lid opens or said first lid opens and said second lid closes, (7) a first pair of waste heat valves operably connected to said first shaft such that when said first lid is opened said first pair of waste heat valves is closed, and when said first lid is closed said first pair of waste heat valves is opened, (8) a second pair of waste heat valves operably connected to said second shaft such that when said second lid is opened said second pair of waste heat valves is closed and when said second lid is closed said second pair of waste heat valves is opened, (9) means coacting with said first lid and said second lid to regulate air flow into said air and waste heat reversing box, (10) a third shaft rotatably mounted to said air and waste heat reversing box, (11) a first flapper air adjusting valve pivotally mounted within said air and waste heat reversing box positioned adjacent to said first lid, (12) means interconnecting said third shaft and said first flapper by which said first flapper can be pivoted when said third shaft is rotated, (13) a fourth shaft rotatably mounted to said air and waste heat reversing box, (14) a second flapper air adjusting valve pivotally mounted within said air and waste heat reversing box positioned adjacent to said second lid, (15) means interconnecting said fourth shaft and said second flapper by which said second flapper can be pivoted when said fourth shaft is rotated, (16) a lever pivotally engaged with said third shaft and connected to said air and flapper valve rod such that linear movement of said air and flapper valve rod causes said first flapper to pivot, (17) a lever pivotally engaged with said fourth shaft and connected to said air and flapper valve rod such that linear movement of said air and flapper valve rod causes said first flapper to pivot, said levers engageably arranged with said third shaft and said fourth shaft such that said third shaft and said fourth shaft rotate simultaneously causing said first flapper to pivot from vertical to horizontal at the same time that said second flapper is caused to pivot from horizontal to vertical and causing said first flapper to pivot from horizontal to vertical at the same time that said second flapper is caused to pivot from vertical to horizontal, said horizontal positions of said flappers coordinated by said reversing machines to correspond to said open positions of said lids when said coke oven is being operated on rich fuel gas and said vertical positions of said flappers corresponding to said open position of said lids when said coke oven is being operated on blast furnace gas, said positions of said flappers being coordinated by said clutch means of said second reversing machine.

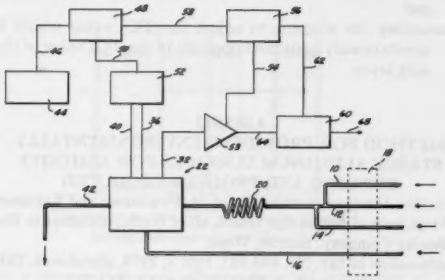
4,085,009

METHODS FOR DETERMINATION OF ENZYME REACTIONS

Salvatore J. Pace, Yorktown Heights, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jul. 28, 1976, Ser. No. 709,470
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **11 Claims**

1. A method for determining the activity of an enzyme in a liquid sample treated with a coenzyme and a substrate for a reaction involving a change in the coenzyme from a first form to a second form, utilizing a three-electrode potentiostat including an auxiliary electrode, comprising the steps of: electrosensitively contacting said treated sample simultaneously with the electrodes of said potentiostat, applying a voltage to said auxiliary electrode to support said reaction, modulating said voltage to change said coenzyme alternately between said first



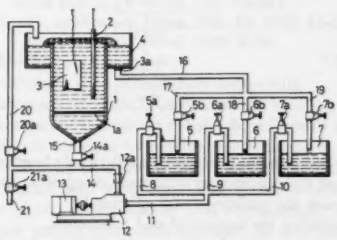
and second forms, and measuring at least one of said forms during said reaction.

4,085,010

PROCESS FOR POWDER-DISPERSED COMPOSITE PLATING

Shigeru Ishimori, Hamamatsu, and Shinichi Honda, Hamamatsu, both of Japan, assignors to Suzuki Motor Company Limited, Japan

Continuation of Ser. No. 435,488, Jan. 22, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,364
Int. Cl.[2] C25D *3/00, 5/00, 15/00, 15/02*
U.S. Cl. 204—16 **175 Claims**



1. A process for high speed plating of an object with a composite plating of a plating metal and a pulverulent material comprising the steps of providing a composite plating solution containing pulverulent material, applying a current density to said object of at least about 15 A/dm^2, and causing a portion of said composite plating solution including substantially all said pulverulent material in said portion to flow in an upward direction at a velocity which is at least about 4.2 cm/sec past the portion of said object which is to be plated.

4,085,011

PROCESS FOR THE PRODUCTION OF A THIN-FILM CIRCUIT

Wilfried Juergens; Manfred Roschy, both of Munich, and Alois Schauer, Gruenwald, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 15, 1976, Ser. No. 732,987
Claims priority, application Germany, Oct. 17, 1975, 2546675
Int. Cl.[2] C25D *5/50*; C23C *15/00*
U.S. Cl. 204—37 R **3 Claims**

1. A process for producing a thin-film circuit which includes temperature-compensated RC elements which have an AlTa alloy layer of approximately 3–17 at% tantalum in aluminum, comprising the steps of:

sputtering the AlTa alloy onto a non-conductive substrate in an operative reactive gas taken from the group consisting

of O_2, CO_2 and N_2 and mixtures thereof, the TC_R value being set by the tantalum component of the alloy layer;

anodizing the layer to provide the dielectric of the capacitor; and

annealing the element to adjust the TC_C value which is approximately equal and opposite to the TC_R value of the Alta layer.

4,085,012

METHOD FOR PROVIDING ENVIRONMENTALLY STABLE ALUMINUM SURFACES FOR ADHESIVE BONDING AND PRODUCT PRODUCED

J. Arthur Marceau, Seattle; Ralph H. Firminhac, and Yukimori Moji, both of Bainbridge Island, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 440,387, Feb. 7, 1974, abandoned. This application Feb. 26, 1976, Ser. No. 661,717

Int. Cl.[2] C25D *11/08, 11/18*

U.S. Cl. 204—38 A **29 Claims**

28. A process for preparing an adhesively bonded aluminum structure from aluminum adherends comprising the steps of:

cleaning the surface of said adherends;

deoxidizing the surface of said adherends;

forming a porous aluminum oxide surface on said adherends by anodization of said adherends in an aqueous acidic solution, the acidic component thereof consisting essentially of phosphoric acid, the anodizing potential being from about 3 to about 25 volts, the phosphoric acid concentration being about 3 to about 20% by weight, the temperature of said solution being in the range of 75°±10° F.;

rinsing said adherends to remove said solution;

applying an epoxy resin primer to said porous aluminum oxide surface;

curing said primer;

applying an adhesive to at least one of said adherends; and

bonding said adherends together to form said adhesively bonded aluminum structure.

4,085,013

CHROMIUM PLATING PROCESS EMPLOYING MANGANESE DIOXIDE COATED ANODES

Ralph F. Hoeckelman, Irwin Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 291,857, Sep. 25, 1972, abandoned. This application May 31, 1977, Ser. No. 801,486

Int. Cl.[2] C25D *3/04*

U.S. Cl. 204—51 **4 Claims**

1. In the plating of a metal article with a chromium containing coating, comprising:

immersing said article in an aqueous, acidic electrolyte containing chromic acid at a concentration of 10 to 500 g/l, and

applying an electric current from an electromotive source connected to said article and to an anode element, said current being sufficient to reduce a desired amount of said chromium ions at the surface of said article to effect the plating thereof,

the improvement which comprises, employing as said anode element an electrically conductive base material, the active surface of which is substantially covered with an overlying coating of conductive MnO_2.

4,085,014

ELIMINATION OF IMPURITIES FROM SEA WATER CELL FEED TO PREVENT ANODE DEPOSITS

John E. Bennett, Painesville, and Joseph E. Elliott, Madison, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Apr. 21, 1977, Ser. No. 789,669

Int. Cl.[2] C25B *1/26*

U.S. Cl. 204—95 **4 Claims**

1. A method for eliminating the formation of manganese impurity caused anode deposits upon the electrolysis of aqueous saline solutions contaminated with manganese, which method comprises contacting said impure aqueous saline solution feed with sufficient sodium hypochlorite solution recycled from the electrolytic cell for a time sufficient to precipitate the manganese present to reduce the dissolved manganese content therein to a level less than about 10 parts per billion by weight manganese and feeding said saline solution now purified with respect to manganese impurities to said electrolytic cell and electrolyzing said saline solution between at least one anode and at least one cathode in said electrolytic cell.

4,085,015

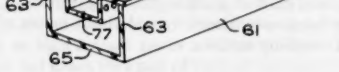
ELECTROLYSIS CELL LIQUOR EMISSION CONTROL PROCESS

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 713,451, Aug. 11, 1976, Pat. No. 4,045,324. This application Apr. 19, 1977, Ser. No. 788,876

Int. Cl.[2] C25B *1/20, 1/26*

U.S. Cl. 204—98 **2 Claims**



1. In a method of electrolyzing alkali metal chloride brine in a bipolar electrolyzer containing a plurality of individual electrolytic cells electrically and mechanically in series, each of said cells being divided into an anolyte chamber and a catholyte chamber, which method comprises feeding alkali metal chloride brine to said cells, passing an electrical current through the individual electrolytic cells of said electrolyzer, recovering chlorine gas from said anolyte chamber, recovering catholyte cell liquor from the catholyte chambers of said cells through individual catholyte liquor recovery means, and collecting said catholyte liquor in a catholyte liquor trough extending alongside said bipolar electrolyzer below said individual catholyte liquor recovery means, the improvement comprising:

providing a top having recesses therein on said cell liquor trough, said recesses having first and second apertures, said first apertures being above said second apertures therein, each of said apertures draining electrolyte to the

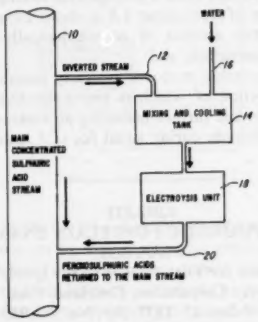
interior of said trough, each of said recesses corresponding to one of said individual catholyte liquor recovery means;

discharging catholyte liquor into said recesses whereby to maintain catholyte liquor in said recesses above said first and second apertures during the flow of catholyte liquor from said catholyte liquor recovery means, and to maintain the electrolyte level below said first apertures during the interruption of catholyte liquor flow from said catholyte liquor recovery means.

4,085,016
METHOD AND APPARATUS FOR THE OXIDATION OF ORGANIC MATERIAL PRESENT IN CONCENTRATED SULFURIC ACID

Mohammad Barakat Ilahi Janjua, Pincourt; Pierre L. Claessens, St. Eustache, and Raouf O. Loutfy, Pierrefonds, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed Oct. 14, 1976, Ser. No. 732,437
Claims priority, application Canada, Jul. 20, 1976, 257399
Int. Cl.² C25B *1/22, 9/00*
U.S. Cl. 204—104 **13 Claims**



1. A method for the on-site generation of peroxosulfuric acids for the oxidation of organic materials in concentrated sulfuric acid comprising the steps of:

(a) diverting a portion of main concentrated sulfuric acid stream;

(b) diluting the diverted stream with water to about 40–70% sulfuric acid concentration;

(c) passing the diluted stream at a temperature between 5° and 20° C through an electrolysis apparatus operated at a current density between 50 and 200 ASD to oxidize some of the sulfuric acid to form a predetermined quantity of peroxosulfuric acids; and

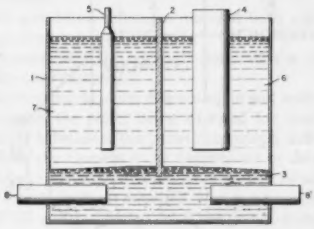
(d) returning the diverted stream with said predetermined quantity of peroxosulfuric acids to the main stream to oxidize the organic materials and decolorize the main stream of sulfuric acid.

4,085,017
RECOVERY OF COPPER AND NICKEL FROM ALLOYS

Thomas A. Henrie, Silver Spring, Md.; Roald E. Lindstrom, Reno, and Kenneth P. V. Lei, Sparks, both of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 6, 1977, Ser. No. 830,517
Int. Cl.² C25C *1/24, 1/08, 1/12*
U.S. Cl. 204—123 **2 Claims**

1. A process for recovery of copper and nickel from alloys comprising providing an electrolytic cell consisting essentially of (1) an anode section containing an aqueous electrolyte solution and an anode consisting essentially of an alloy of copper and nickel, (2) a separate cathode section, and (3) an intermediate electrode consisting essentially of a liquid copper-mercury alloy at a temperature of about 85° to 100° C between said anode section and said cathode section, and operating said cell



for a time sufficient to effect substantial dissolution of the copper-nickel alloy anode and deposition of metallic copper at the cathode.

4,085,018
PHOTOCURABLE RESIN COMPOSITIONS

Nagao Ariga, Ichihara; Junji Nanbu, and Hiroshi Oikawa, both of Chiba, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 764,997
Claims priority, application Japan, Feb. 10, 1976, 51-12843
Int. Cl.² C08L *63/00;* **C08F** *8/00*
U.S. Cl. 204—159.15 **7 Claims**

1. A photocurable resin composition comprising

(I) an unsaturated polyester resin obtained by reacting (B) an epoxy compound containing at least about 2 epoxy groups per molecule obtained by reacting methylidene diphenol with β-methylepichlorohydrin or epichlorohydrin, with (C) an unsaturated monobasic acid in the presence or absence of (A) a dicarboxylic acid containing at least 4 methylene groups interposed between the two carboxyl groups, or a carboxyl-terminated oligopolyester obtained by esterifying a saturated or unsaturated dibasic acid with a polyhydric alcohol,

(II) a polymerizable vinyl monomer capable of addition polymerization with the unsaturated polyester resin (I), and

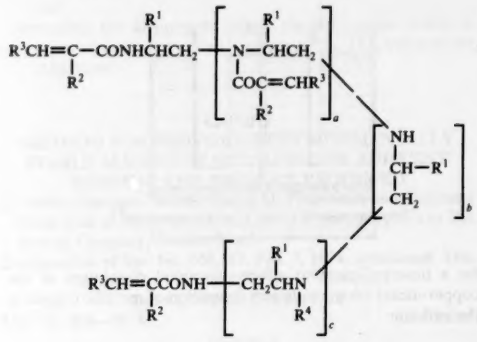
(III) a photopolymerization initiator having an action of promoting radical polymerization by the irradiation of light.

4,085,019
ACTINICALLY-INDUCED POLYERMIZATION

George Edward Green, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 19, 1975, Ser. No. 588,532
Claims priority, application United Kingdom, Jul. 5, 1974, 29802/74
Int. Cl.² H01L *13/00;* **C08F** *8/00, 2/46*
U.S. Cl. 204—159.23 **18 Claims**

1. A method of polymerising an amide of the general formula



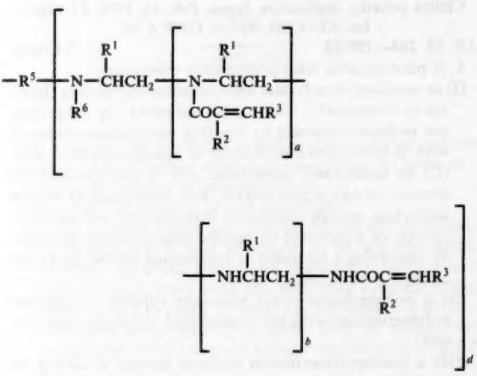
where

each R^1 denotes a hydrogen atom or a methyl group,

each R^1 denotes a hydrogen, chlorine, or bromine atom, a cyano group, or an alkyl group of 1 to 4 carbon atoms,

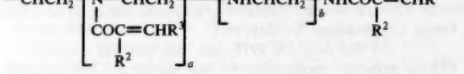
each R^3 represents an aliphatic, cycloaliphatic, araliphatic, or heterocyclic group of 2 to 12 carbon atoms and containing ethylenic unsaturation in conjugation with the indicated double bond,

R^4 represents a group of formula



R^5 represents a grouping of valency $(1 + d)$, containing up to 50 carbon atoms, linked through a carbon atom or carbon atoms thereof to the indicated nitrogen atom or atoms,

R^6 represents a hydrogen atom or a chain of formula



d is an integer of 1 to 3, and

each a, b, and c is zero or a positive integer such that the molecular weight of the said amide is from 500 to 250,000,

which comprises subjecting the amide to actinic radiation.

4,085,020

ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF COPOLYMERS OF POLYETHYLENICALLY UNSATURATED EPOXY-AMINE ADDUCTS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 576,714, May 12, 1975. This application Apr. 21, 1977, Ser. No. 789,653

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 C **8 Claims**

1. A method of electrodepositing a physically tough, corrosion resistant coating on the cathode of a unidirectional electrical system from an aqueous bath having a pH of 5.0–7.5 comprising passing a unidirectional electrical current through an aqueous electrocoat bath comprising a water dispersion having a resin solids content of from 2–20% by weight, said resin solids including a nongelled, amine-functional polymer dispersed in water with the aid of a solubilizing acid and curing agent therefor, said amine-functional polymer being a copolymer of:

(A) an ethylenically unsaturated hydroxy functional amine adduct free of epoxy groups and containing from about 1.4 to about 2.0 ethylenically unsaturated amine groups per molecule, formed from a polyepoxide having a 1,2-epoxy equivalency of from about 1.4 to about 2.0 and at least a stoichiometric amount of an ethylenically unsaturated primary monoamine; and

(B) copolymerizable monoethylenically unsaturated monomers, a portion of which is amine-functional; and said water dispersion further including an aminoplast or phenol-formaldehyde curing agent for said amine-functional polymer.

4,085,021

ELECTROPHORETIC PORCELAIN ENAMELING PROCESS

William Ewald van der Vliet, Capelle an der Ijssel, Netherlands, assignor to Ferro Corporation, Cleveland, Ohio

Filed Jan. 27, 1977, Ser. No. 763,020

Claims priority, application Netherlands, Feb. 2, 1976, 7601007

Int. Cl.[2] C25D *13/02, 13/10*

U.S. Cl. 204—181 N **5 Claims**

1. In a process for the simultaneous electrophoretic deposition of at least two classes of particles normally having dissimilar zeta potentials respectively, and consequently different deposition velocities, the improvement of adjusting and stabilizing said velocities, respectively, of the said two classes of particles, by the addition to the electrophoretic bath of at least one positive ion, in a concentration ranging from 10 to 95% of the concentration necessary, vis-a-vis the total ionized particles present, to stabilize the zeta potential of the particles to be deposited electrophoretically, back to zero.

4,085,022

METHOD AND APPARATUS FOR CONTROLLING THE REMOVAL, BY MEANS OF ION ETCHING, OF A THIN LAYER FROM A SUBSTRATE

Reiner Wechsung, Cologne, and Jürgen Kirschner, Aachen, both of Germany, assignors to Leybold-Heraeus GmbH & Co. Kommandit-Gesellschaft, Cologne, Germany

Filed Jan. 28, 1977, Ser. No. 763,689

Claims priority, application Germany, Jan. 31, 1976, 2603675

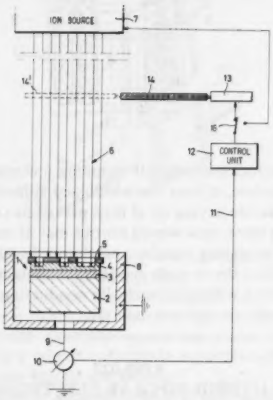
Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 E **8 Claims**

1. A method of removing a thin surface layer, or regions of the thin layer as determined by masks, from a substrate of a sample, which substrate has a chemical composition different from that of said layer, by an ion etching process including: mounting the sample to be etched in an electrically insulated manner; bombarding the surface of the layer to be removed with an ion beam of substantially uniform current density

generated in an ion source; and controlling the removal of the layer or regions thereof by measuring the sample current, which is composed of the ion current and further surface specific components, during the ion etching process to derive an electrical signal which changes after the removal of said layer from the substrate, and interrupting the ion bombardment of the sample surface by the ions from the ion source upon a change in the measured sample current.

3. Apparatus for removing a thin surface layer, or regions of the thin layer as determined by masks, from a substrate of a sample, which substrate has a chemical composition different from that of said layer, by an ion etching process comprising in



combination: means for mounting said sample in an electrically insulated manner; an ion source means for generating a beam of ions of substantially uniform current density and for bombarding the surface of said layer of said sample to be removed with said ion beam; a current measuring means comnnected to said sample for measuring the sample current, which is composed of the ion current and further surface specific components, during the ion etching process; and means connected to said current measuring means and responsive to the measured current for interrupting the bombardment of the surface of the sample by said ion beam produced by said ion source upon a change in the measured current, which change indicates the removal of said layer.

4,085,023

APPARATUS FOR DETECTING ELEMENTS

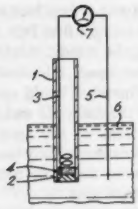
Derek John Fray, Haslingfield, England, assignor to National Research Development Corporation, London, England

Filed Jul. 1, 1975, Ser. No. 592,200

Claims priority, application United Kingdom, Jul. 3, 1974, 29490/74

Int. Cl.[2] G01N 27/46

U.S. Cl. 204—195 S **14 Claims**



1. An apparatus for use in the detection or determination of an element in a substance containing said element, comprising:

a voltmeter;

a substance-contactable electrode connected to one side of the voltmeter;

a reference electrode connected to the other side of the voltmeter;

a solid powdered reference material with which the reference electrode is in contact;

a tube containing the reference material, the tube being of a refractory material,

a solid electrolyte pellet containing in and sealing one end of the tube, the pellet being exposed for contact with the sample substance, the pellet comprising a β-alumina containing the element to be determined or detected;

the reference material being a compound of said element to be determined or detected which compound is solid at 750° C. and is selected from the group consisting of two-phase β-alumina, a mixture of α-alumina and β-alumina, a tungstate, a molybdate and a vanadate, the tube being dippable into the substance containing said element to be detected or determined.

4,085,024

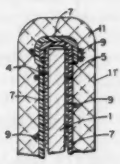
GALVANIC CELL ASSEMBLY FOR DETECTING OXYGEN AND METHOD OF MAKING SAID CELL

Thomas E. Lawson, Denver, Colo., assignor to Lexington Instrument Corporation, Waltham, Mass.

Filed Aug. 26, 1976, Ser. No. 717,771

Int. Cl.[2] G01N 27/46

U.S. Cl. 204—195 R **24 Claims**



1. An electrode assembly for detecting and measuring small amounts of oxygen absorbed by the assembly comprising,

a. a central anode formed of at least one material selected from the group consisting of cadmium, arsenic, bismuth, antimony, lead and ferrous hydrate, said anode providing an anode surface,

b. a sheet of porous, nonconductive electrolyte retentive material wrapped around the anode in intimate contact therewith,

c. a porous cathode formed of at least one material selected from the group consisting of carbon, gold and platinum, folded over the electrolyte retentive material in intimate contact at the interface therewith,

d. an anode conductor at the center of the anode material in intimate contact with said anode material,

e. a conductive lead extending from the anode conductor and providing an anode terminal,

f. a cathode conductor between the cathode and the porous, nonconductive, electrolyte retentive material extending throughout said interface in intimate contact with the cathode material and

g. a conductive lead extending from the cathode conductor and providing a cathode terminal.

11. A method of making an electrode assembly for measuring small amounts of oxygen absorbed by the assembly comprising the steps:

a. providing a metal anode plate;

b. attaching a metal anode screen bearing an anode material selected from the group consisting of cadmium, arsenic, bismuth, antimony, lead and ferrous hydrate to each side of the anode plate;

c. wrapping a sheet of porous, non-conductive electrolyte retentive material around the metal screen;

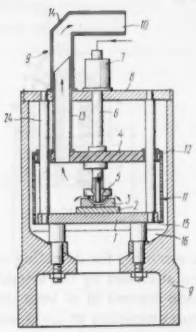
d. wrapping a metal wire around the sheet of electrolyte retentive material;
e. wrapping a sheet of cathode material selected from the group consisting of carbon, gold and platinum, around the sheet of electrolyte retentive material;
f. immersing the assembly in an electrolyte solution; and
g. enclosing said assembly in a sealed envelope.

4,085,025

APPARATUS FOR ELECTROCHEMICAL MACHINING OF WORKPIECES

Zinovy Abramovich Lekarev, ulitsa Trinklera, 20, kv. 71; Pavel Semenovich Razdymakha, ulitsa Bljukhera, 26, kv. 121; Vladimir Nikolaevich Davydov, ulitsa Gvardeitsev Shironintsev, 11, kv. 13; Vladillen Antonovich Shaforostov, ulitsa Bairona, 138a, kv. 28; Leonid Pavlovich Kolosov, ulitsa Somovskaya, 37/39, kv. 24; Vladimir Isaakovich Suslin, ulitsa Frunze, 17, kv. 46; Boris Anatolievich Makeev, ulitsa Novgorodskaya, 6, kv. 29; Alexandr Ivanovich Dubovik, ulitsa Gvardeitsev Shironintsev, 63a, kv. 22; Anatoly Alexeevich Kolesnichenko, ulitsa Oktyabrskoi Revoljutsii, 36, kv. 11; Alexandr Ivanovich Etnaer, ulitsa Derevyanko, 24, kv. 2, and Vitaly Alexandrovich Pilipenki, ulitsa Vorobieva, 15/19, kv. 2, all of Kharkov, U.S.S.R.

Filed Aug. 11, 1977, Ser. No. 823,861
Int. Cl.² B23P *1/04, 1/12*
U.S. Cl. 204—224 M **4 Claims**



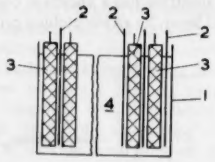
1. An apparatus for electrochemical machining of workpieces, comprising:
at least one work table;
a device to accommodate a workpiece to be machined, securable on a respective work table;
an electrode tool for performing machining of the workpiece;
a movable crossbeam having said electrode tool secured thereon;
a drive to effect reciprocation of said movable crossbeam, to bring said electrode tool toward and away from the workpiece;
a stationary crossbeam having said drive mounted thereon;
a ventilation conduit;
an exhaust device for withdrawing vapors and fumes produced in the process of electrochemical machining of workpieces from the working zone;
an exhaust pipe of said exhaust device, mounted on said movable crossbeam and telescopingly connected with said ventilation conduit for motion therein;
abutment means accommodated in said ventilation conduit, to provide for closing off said ventilation conduit, when said electrode tool is retracted from the workpiece;
an electrolyte splashing-preventing device, including a protective casing, and protective casing being mounted on said movable crossbeam and connected with said exhaust pipe.

4,085,026

ANODE ASSEMBLY FOR ELECTRODEPOSITION CELL

Phillip Charles Halford, Walsall, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Jun. 9, 1976, Ser. No. 694,324
Claims priority, application United Kingdom, Jun. 13, 1975, 25383/75
Int. Cl.² C25C *7/04;* **C25B** *13/08*
U.S. Cl. 204—242 **10 Claims**



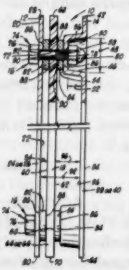
1. An electrodeposition cell including a container for holding an electrolyte, at least one anode and at least one cathode, the or each anode having on at least part of its exterior surface a layer of an open, non-woven fibrous mat of resilient, fibrous electrically insulating members randomly bonded to one another to protect the or each anode from contact with an adjacent cathode or with an electrically conducting solid member in contact with an adjacent cathode.

4,085,027

HYBRID BIPOLAR ELECTRODE

Kenneth A. Poush, Lake Jackson, Tex., and James E. Reynolds, Golden, Colo., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Jan. 29, 1975, Ser. No. 545,016
Int. Cl.² C25B *9/00, 11/00, 13/00, 1/34*
U.S. Cl. 204—268 **14 Claims**

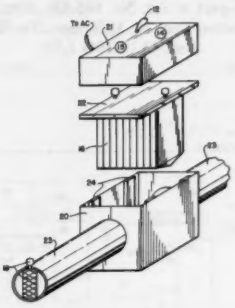


1. A hybrid bipolar electrode, for use in an electrolytic cell wherein the bipolar electrode is at least partially immersed in an electrolyte, said bipolar electrode comprising:
an anodic member having a first face and a second face;
a cathodic member having a first face and a second face;
means for supporting the anodic member and the cathodic member in a spaced apart relationship with the second face of the anodic member being spaced a distance from the second face of the cathodic member;
means engaging portions of the anodic member and the cathodic member for substantially sealing electrolyte from a substantial portion of the space between the anodic and the cathodic members; and
means having a portion constructed of an electrically conductive material and portions contacting the anodic member and the cathodic member, said means electrically connecting the anodic member and the cathodic member in series.

4,085,028
ELECTROLYTIC CHLORINATION DEVICE

John McCallum, Worthington, Ohio, assignor to Electro-Chlor Corporation, Worthington, Ohio

Filed Nov. 21, 1974, Ser. No. 525,882
Int. Cl.[2] C02B *1/82*
U.S. Cl. 204—269 10 Claims



1. Apparatus for electrolyzing a dilute aqueous brine solution flowing therethrough comprising:

a. a full-wave bridge rectifier adapted to be electrically connected directly to a source of alternating current;

b. an electrode assembly connected across said rectifier comprising a negative electrode, a positive electrode, and one or more bipolar electrodes;

c. a cell enclosure adapted to receive and support said electrode assembly and further adapted to the flow of said dilute aqueous brine solution therethrough; and

d. grounding means surrounding said electrode assembly; the number, *n*, of bipolar electrodes, the height, *h*, of the electrodes, and their spacing, gap, being determined by the equations:

I. $n \times \text{gap} \times h = k \times$ gallons/minute;

II. av. dc. volts $= 2.1 \times n + n \times \text{gap} \times R \times CD$;

where:

n = number of bipolar electrodes + 1;

gap = distance in inches between opposing faces of adjacent electrodes;

h = the height in inches of the electrode surfaces exposed to contact with said brine solution;

gallons/minute = total flow through said apparatus and through said electrode assembly in gallons per minute of said aqueous brine solution;

av. d.c volts = root mean square voltage $\times$ 0.0637/0.707;

R = resistivity of said aqueous brine solution in ohm-inches;

CD = average maximum current density in amperes per square inch; and

k = about 0.038 to about 0.077.

4,085,029
METHOD FOR SEPARATING LIQUID AND SOLID PRODUCTS OF LIQUEFACTION OF COAL OR LIKE CARBONACEOUS MATERIALS

John M. Malek, P.O. Box 71, Lomita, Calif. 90717

Filed Jan. 12, 1976, Ser. No. 648,108
Int. Cl.[2] C10G *1/04*
U.S. Cl. 208—8 10 Claims

1. In a process for converting coal into coal derived hydrocarbons by subjecting subdivided coal in the presence of a coal derived solvent and hydrogen to the effects of elevated pressure and temperature in a converter, in which process gasiform products are separated from slurryform products, the improvement for increasing the efficiency of separation of coal derived solids contained in said slurryform, comprising treating at least a part of the said slurryform in the presence of bubbling steam with an alkaline compound selected from the group consisting of alkali and alkaline earth metal hydroxides, ammonium hydroxide, and alkali metal carbonates, and subjecting the treated slurryform product to gravity settling and forming, in a gravity settler, a solids rich fraction as a lower layer, a predominantly aqueous fraction as an intermediate liquid layer, a hydrocarbon liquid rich portion as an upper layer, and a froth fraction with entrained solid fines aqueous droplets gas bubbles suspended in an oil medium as a top layer, and withdrawing at least a part of the solids rich layer from the gravity settler.

4,085,030
PYROLYSIS OF CARBONACEOUS MATERIALS WITH SOLVENT QUENCH RECOVERY

Norman W. Green, Upland, Calif.; Kandaswamy Duraiswamy, Sterling, Va.; Robert E. Lumpkin, Claremont, Calif.; Everett W. Knell, Los Alamitos, Calif.; Zia I. Mirza, La Verne, Calif., and Bruce L. Winter, Claremont, Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jun. 25, 1976, Ser. No. 700,008
Int. Cl.[2] C10G *1/02;* C10B *49/08*
U.S. Cl. 208—8 78 Claims

1. A continuous process for recovery of values contained in solid carbonaceous materials which comprises the steps of:

a. providing a feed stream containing a particulate solid carbonaceous material, a substantial portion of the particulate solid carbonaceous material being of a particle size less than about 1000 microns in diameter;

b. subjecting the particulate solid carbonaceous material particles to flash pyrolysis by continuously:

(i) transporting the particulate solid carbonaceous material containing feed stream contained in a carrier gas which is substantially nondeleteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material to a solids feed inlet of a substantially vertically oriented, descending flow pyrolysis reactor having a substantially vertically oriented pyrolysis zone operated at a pyrolysis temperature above about 600° F;

(ii) feeding a particulate source of heat at a temperature above the pyrolysis zone temperature to a substantially vertically oriented chamber surrounding the upper portion of the pyrolysis reactor, the chamber having an inner peripheral wall forming an overflow weir to a vertically oriented mixing section of the vertically oriented descending flow pyrolysis reactor, the particulate heat source in said chamber being maintained in a fluidized state by the flow therewith of an aerating gas substantially nondeleteriously reactive with respect to products of pyrolysis of the particulate solid carbonaceous material;

(iii) discharging the particulate source of heat over said weir and downwardly into said mixing section at a rate sufficient to maintain said pyrolysis zone at the pyrolysis temperature;

(iv) injecting the particulate solid carbonaceous material feed stream and carrier gas from the solids feed inlet into the mixing section to form a resultant turbulent mixture of the particulate source of heat, the particulate solid carbonaceous material particles and carrier gas;

(v) passing the resultant turbulent mixture downwardly from said mixing section to the pyrolysis zone of said pyrolysis reactor to pyrolyze the solid carbonaceous material particles and yield a pyrolysis product stream containing as particulate solids, the particulate source of heat and a carbon containing solid residue of pyrolysis of the particulate solid carbonaceous material, and a vapor mixture of carrier gas and pyrolytic vapors comprising volatilized hydrocarbons including tars;

c. passing the pyrolysis product stream from said pyrolysis reactor to a separation zone to separate at least the bulk of the particulate solids from the vapor mixture;

d. forming the particulate source of heat by:

(i) transporting the separated particulate solids from the separation zone to an oxidation stage with a transport gas containing free oxygen with resultant carbon monoxide formation from reaction of oxygen in the transport gas with carbon in the particulate solids; and

(ii) combining the transported particulate solids, carbon monoxide and transport gas in the oxidation stage with a source of free oxygen in an amount at least equal to 50 mole percent of the carbon monoxide entering the oxidation stage, the total free oxygen in the transport gas and combined in the oxidation stage being sufficient to raise the solids to a temperature above the pyrolysis temperature and thus form a particulate source of heat;

e. passing the particulate source of heat and gases present in the oxidation stage from the oxidation stage to a cyclone separation zone comprising at least two cyclone separation stages in series to separate the bulk of the particulate source of heat from the gases in the first cyclone separation stage to form the feed to the substantially vertically oriented chamber and to separate a fines fraction of the particulate source of heat from the gases in the remaining cyclone separation stages; and

f. recovering tar and low boiling hydrocarbon values from the vapor mixture by the steps of:

(i) contacting the vapor mixture with a quench liquid consisting essentially of hydrocarbons, said quench liquid having a temperature sufficiently low to form a tar-containing condensate and a vapor residue from the vapor mixture, the condensate and quench liquid forming a combined liquid stream;

(ii) mixing a viscosity-lowering liquid comprising hydrocarbons with the combined liquid stream, thereby forming a mixed liquid, said viscosity-lowering liquid having a viscosity lower than the viscosity of said mixed liquid, and said mixed liquid having a viscosity lower than the viscosity of said combined liquid stream;

(iii) cooling a first portion of said mixed liquid to form said quench liquid for contacting the vapor mixture;

(iv) separating a second portion of said mixed liquid into at least a viscosity-lowering liquid for mixing with said combined liquid stream and a tar fraction having a higher volume average boiling point than the volume average boiling point of said viscosity-lowering liquid; and

(v) recovering said tar fraction.

4,085,031

COAL LIQUEFACTION WITH SUBSEQUENT BOTTOMS PYROLYSIS

George P. Walchuk, Queens, N.Y., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 11, 1976, Ser. No. 713,478
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **11 Claims**

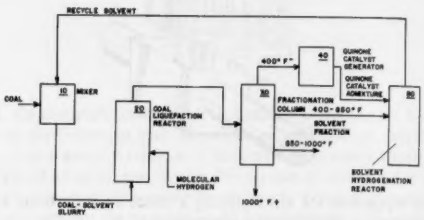
1. In a process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids wherein said solids are reacted with hydrogen under liquefaction conditions in a first liquefaction zone, a high boiling liquefaction bottoms stream composed primarily of constituents nominally boiling in excess of about 1000° F. is separated from the first liquefaction zone effluent, at least part of said liquefaction bottoms stream is pyrolyzed in a pyrolysis zone, and gases, liquids nominally boiling below about 1000° F., a high boiling pyrolysis bottoms stream boiling in excess of about 1000° F., and coke are recovered from the pyrolysis zone, the improvement which comprises reacting at least a portion of said pyrolysis zone, the improvement which comprises reacting at least a portion of said pyrolysis bottoms stream with hydrogen in the presence of a solvent under liquefaction conditions in a second liquefaction zone external of said first liquefaction zone.

4,085,032

HYDROGEN DONOR SOLVENT COAL LIQUEFACTION PROCESS

Thomas Aczel, and Karl W. Plumlee, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 686,813, May 17, 1976, Pat. No. 4,049,536, and a continuation-in-part of Ser. No. 686,814, May 17, 1976, Pat. No. 4,049,537, and a continuation-in-part of Ser. No. 686,827, May 17, 1976, Pat. No. 4,051,012, and a continuation-in-part of Ser. No. 686,828, May 17, 1976. This application Dec. 29, 1976, Ser. No. 755,174
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—10 **7 Claims**



1. In a process for liquefying a particulate coal feed to produce useful petroleum-like liquid products by the steps of

contacting, in a liquefaction zone, said coal feed with a hydrogen donor solvent and a quinone catalyst at temperature and pressure sufficient by hydroconvert and liquefy the coal,

separating the product from the liquefaction zone into fractions inclusive of a 400° F.− liquid fraction and a liquid solvent fraction which contains at least 30 weight percent hydrogen donor compounds,

hydrogenating said liquid solvent fraction in a hydrogenation zone, and

recycling the hydrogenated liquid solvent mixture to said coal liquefaction zone,

the improvement comprising

passing said 400° F.− liquid fraction into an oil-water separation zone, and stratifying said 400° F.− liquid fraction into a C_1–400° F. liquid hydrocarbon phase and an aqueous slurry phase which contains quinone catalyst,

separating said aqueous slurry phase from said C_1–400° F. hydrocarbon phase, passing said aqueous slurry phase into a vacuum distillation zone and removing water from said slurry to concentrate the quinone catalyst within said phase, and then

recycling said quinone catalyst containing aqueous slurry phase to said solvent hydrogenation zone or to said coal liquefaction zone, or both, to catalyze either or both of these reactions.

4,085,033

HYDROGEN DONOR SOLVENT COAL LIQUEFACTION PROCESS

Karl W. Plumlee, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 686,813, May 17, 1976, Pat. No. 4,049,536, and a continuation-in-part of Ser. No. 686,814, May 17, 1976, Pat. No. 4,049,537, and a continuation-in-part of Ser. No. 686,827, May 17, 1976, Pat. No. 4,051,012, and a continuation-in-part of Ser. No. 686,828, May 17, 1976. This application Dec. 29, 1976, Ser. No. 755,175
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—10 **10 Claims**

1. In a process for liquefying a particulate coal feed to produce useful petroleum-like liquid products by the steps of

(a) contacting, in a liquefaction zone, said coal feed with a

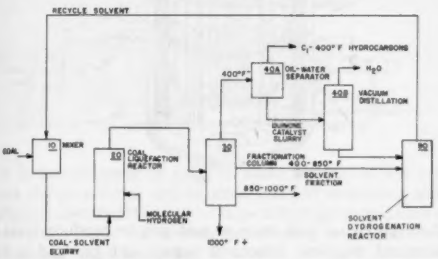
hydrogen donor solvent at temperature and pressure sufficient to hydroconvert and liquefy the coal,

(b) separating the product from the liquefaction zone into fractions inclusive of a C_1 — 700° F. liquid hydrocarbon fraction and a liquid solvent fraction which contains at least 30 weight percent hydrogen donor compounds,

(c) hydrogenating said liquid solvent fraction in a hydrogenation zone, and

(d) recycling the hydrogenated liquid solvent mixture to said coal liquefaction zone,

the improvement comprising



contacting the C_1—700° F. liquid hydrocarbon fractions with an aqueous alkaline medium to form a hydrocarbon phase and an aqueous extract phase which contains an admixture of indigenous phenolic compounds,

neutralizing said aqueous extract phase with acid,

contacting said neutralized aqueous phase with hydrogen peroxide to introduce hydroxyl groups into the nuclei of the phenolic compounds to convert said phenolic compounds into hydroquinones which can function in a coal liquefaction zone as a quinone catalyst, and then

recycling said hydroquinones, with said hydrogenated liquid solvent mixture, to said coal liquefaction zone to catalyze the coal liquefaction reaction.

4,085,034

METHOD FOR THE THERMAL CRACKING OF HEAVY HYDROCARBON

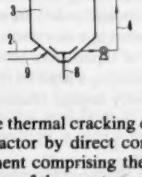
Tomizo Endo; Yutaka Sumida; Toru Kawahara; Masaichi Ohtake; Shoichi Motokawa; Keiji Nagayama; Masatomo Shigeta; Hiroshi Hozuma; Masaharu Tomizawa, and Hideo Kikuchi, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, both of Japan

Filed Oct. 14, 1976, Ser. No. 732,301

Claims priority, application Japan, Oct. 14, 1975, 50-122855; Oct. 14, 1975, 50-122857

Int. Cl.² C10G *9/16, 9/18*

U.S. Cl. 208—48 R **3 Claims**



1. In a process for the thermal cracking of a heavy hydrocarbon in a cylindrical reactor by direct contact with a heating medium, the improvement comprising the steps of:

(a) removing a portion of the reactor contents from a lower section of the reactor; and

(b) injecting said portion into an annular recess provided around the circumference of the upper interior of the reactor in a direction tangential to the inner cylindrical wall of the reactor from a plurality of points on the wall, thereby filling the annular recess by centrifugal force and forming a liquid curtain over the cylindrical wall surface of the reactor below the injection point.

4,085,035

HYDROGENATION PROCESS USING NOBLE METAL CATALYSTS PROMOTED BY LIQUID FLUORINE CONTAINING ACIDS

Jos Wristers, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 577,351, May 14, 1975, Pat. No. 4,025,459. This application Dec. 7, 1976, Ser. No. 748,209

Int. Cl.² C07C *5/10*; C10G *23/04*

U.S. Cl. 208—143 **30 Claims**

1. A process for the hydrogenation of aromatic compounds in an unsaturated hydrocarbon fraction comprising them which comprises contacting said unsaturated hydrocarbon fraction with a catalyst selected from the group consisting of the elemental, oxide and sulfide forms of platinum and iridium and the elemental and oxide forms of palladium promoted with a liquid acid system, said liquid acid system being selected from the group consisting of liquid Bronsted acids containing fluorine and fluorine containing Friedel-Crafts catalyst in liquid Bronsted acids containing fluorine, said contacing being conducted in the presence of said liquid acid system in a pressurized hydrogen atmosphere at a temperature sufficient to facilitate the reaction.

4,085,036

PROCESS OF HYDRODESULFURIZATION AND SEPARATE SOLVENT EXTRACTION OF DISTILLATE AND DEASPHALTED RESIDUAL LUBRICATING OIL FRACTIONS

Harry C. Murphy, Jr., Apollo, and Harry C. Stauffer, Cheswick, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 1, 1976, Ser. No. 737,491

Int. Cl.² C10G *23/00, 34/00*

U.S. Cl. 208—212 **5 Claims**

1. A process which comprises (a) contacting a crude oil having a crude lubricating oil fraction containing at least 1.5 weight percent sulfur with hydrogen and with a hydrogenation catalyst to obtain a hydrodesulfurized product wherein at least 60 percent by weight of the sulfur contained in said crude lubricating oil fraction has been separated therefrom, (b) fractionating the hydrodesulfurized product of step (a) to obtain a residual lubricating oil fraction 90 percent of which boils above 950° F. and at least one distillate lubricating oil fraction 90 percent of which boils above 650° F. (c) deasphalting said residual lubrication oil fraction, (d) separately extracting said at least one distillate lubricating oil fraction and said deasphalted residual lubricating oil fraction with a solvent selected from the group of phenol, furfural or sulfur dioxide and mixtures thereof to reduce the aromatic content of said at least one distillate fraction and said deasphalted residual lubricating oil fraction, said extracting being performed in a counter current tower, wherein the solvent is introduced into the top section of the tower and the oil fraction from step (c) is introduced at the middle or bottom section of the tower under conventional temperatures and pressures, and (e) separating the solvent from the extracted lubricating oil products.

4,085,037

PROCESS FOR SEPARATION OF NON-MAGNETIC PARTICLES WITH FERROMAGNETIC MEDIA

Jean Marie Quets, and Henri Hatwell, both of White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

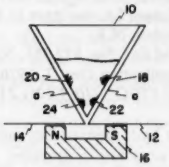
Filed Dec. 29, 1975, Ser. No. 644,806

Int. Cl.² B03B *5/30*

U.S. Cl. 209—1 **6 Claims**

1. Process for separating solid particles from admixture

which comprises providing a homogeneous ferrohydrodynamic medium containing a colloidal suspension of superparamagnetic particles therein, said medium being in the molten state and also containing a mixture of at least two non-colloidal non-magnetic particles of differing densities both of which are greater than the actual density of the medium, imposing a



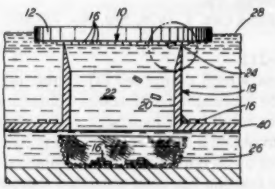
non-uniform magnetic field upon said particles and said ferrohydrodynamic medium whereby the said particles are moved within said medium and segregated into different zones thereof in accodance with the respective densities of the particles, solidifying the liquid medium constituting at least one of said zones to immobilize the particles as segregated therein and to prevent the introduction thereinto of extraneous particles.

4,085,038

METHODS OF AND APPARATUS FOR SORTING PARTS OF A SEPARATED ARTICLE

Werner F. Esseluhn, Wyomissing, Pa., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,943
Int. Cl.[2] B07C *7/00*
U.S. Cl. 209—71 **24 Claims**



1. A method of sorting parts of an article which has been mounted onto a carrier and separated into a plurality of individual parts which are retained on the carrier comprising:

positioning the separated article and the carrier adjacent to a passageway so that the parts of a first portion of the separated article lie over the passageway while the parts of a second portion of the separated article lie outside of the passageway; and

subjecting the separated article to a force for demounting the parts of the first portion of the separated article from the carrier to permit such parts to enter into the passageway.

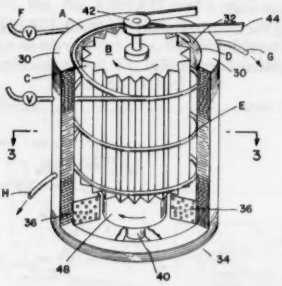
4,085,039

MAGNETIC SEPARATOR WITH HELICAL CLASSIFYING PATH

James W. Allen, 8 Dover Ct., Orinda, Calif. 94563

Filed May 24, 1976, Ser. No. 689,216
Int. Cl.[2] B03C *1/24*
U.S. Cl. 209—220 **12 Claims**

1. A magnetic separator for continuously classifying mixed tailings and magnetic or paramagnetic concentrate comprising: a conduit defining a helical classifying path having an upper concentrate output, a lower tailings output, and an input for mixed concentrate and tailings therebetween; means for defining a high permeability magnetic field path on either side of said helical classifying path of said conduit including a stator on one side of said helical classifying path and a rotor on the other side of said helical classifying path with said conduit occupying a gap in said high permeability magnetic field path between said stator and rotor; means for generating a magnetic field communicated through said stator and rotor; a plurality



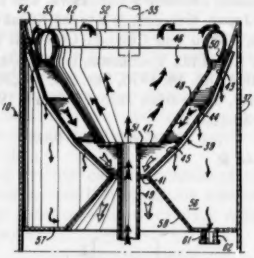
of serrations on said rotor at said gap to produce areas of decreased magnetic reluctance across said gap and in said conduit; and, means for rotating said rotor to wind said concentrate at least from said input to said upper output of said helical classifying path.

4,085,040

FRONT FEED STATIC SCREEN

John J. Egan, Dayton, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Oct. 4, 1976, Ser. No. 729,253
Int. Cl.[2] B01K *29/42*
U.S. Cl. 209—244 **10 Claims**

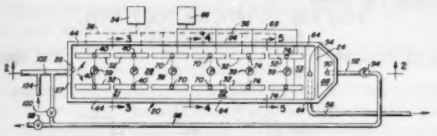


1. Apparatus for separating and/or classifying components of a mixture of liquids and solids forming a slurry including screen structure presenting a descending flow surface adapted to induce separation of liquid from solids as a slurry is moved thereacross, means defining a head box positioned forwardly of and in a facing relatively nesting relation to the flow surface of said screen structure, said head box being arranged to receive a slurry and to discharge said slurry therefrom by overflow, said head box including a weir-like overflow lip positioned in adjacent facing relation to the upper end of said descending flow surface and arranged to form therewith means defining a limiting passage for confining the discharging slurry to said descending flow surface and to firmly control the slurry in a manner to insure that it assumes a relatively uniform sheet-like form as it moves down said flow surface.

4,085,041
BIOLOGICAL OXIDATION AND FLOTATION APPARATUS AND METHOD

Donald Griswold Fullerton, Denver; Gilbert Mowder Kyrias, Littleton, and Richard Baxter Weber, Denver, all of Colo., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 535,133, Dec. 20, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,162
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—7 **81 Claims**



1. In the treatment of aqueous waste material by the activated sludge process, said aqueous material containing solid particles suspended therein, the steps of biological oxidation of said waste material and removal therefrom of suspended solids by flotation which comprise:

introducing said aqueous waste material and return activated sludge into a treatment and flotation chamber, said chamber having (a) a quiescent zone in the upper portion thereof extending horizontally through at least the downstream part of said chamber, and extending vertically downward at least about three inches below the level to which the chamber is filled with mixed liquor comprised of said aqueous waste material and return activated sludge, for accumulation and concentration of floated solids, and (b) a recirculation zone below said upper quiescent zone for continuous recirculation of the contents of said recirculation zone;

introducing a quantity of oxygen-containing gas bubbles into the lower portions of said mixed liquor in the treatment and flotation chamber, the bubbles introduced into the portion of said chamber over which said upper quiescent zone lies being produced directly from gas in the free state and being introduced through the gas diffusing surface of a gas diffusing means at a pressure substantially the same as the hydrostatic pressure of the liquid at the point of introduction of said bubbles into said liquid, a substantial portion of said latter bubbles being large enough to avoid total dissolution in said liquid in any region adjacent said point of introduction into said body of liquid, substantially all of said latter bubbles being no more than about 500 microns in diameter at said point of introduction, and said latter bubbles being introduced at a volumetric gas flow rate in the range from about 0.05 to about 120 cubic feet per minute for each square foot of active area of said gas diffusing surface in such quantity that (a) the initial velocity of liquid movement accompanying the introduction of said bubbles into the mixed liquor is low enough to permit said quiescent zone to be maintained in the upper portion of said chamber, (b) the oxygen provided by said bubbles that is absorbed by the mixed liquor produces biological oxidation of waste matter in said material, and (c) some of said bubbles, comprised in part of carbon dioxide resulting from said biological oxidation, attach themselves to some of said solid particles to form a float of intermixed solid sludge and gas bubbles, said float having a lower density than the aqueous medium in which said solid particles are suspended;

continuously recirculating throughout any upstream part of said chamber that is free of said quiescent zone the mixed liquor that is located in said upstream part of said chamber;

continuously recirculating throughout said recirculation zone in at least the downstream part of said chamber the mixed liquor that is located in said recirculation zone;

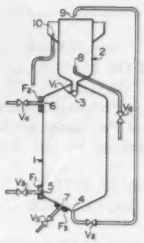
withdrawing at least a portion of said floated sludge from the top of said treatment and flotation chamber; and

withdrawing mixed liquor from the bottom portion of said treatment and flotation chamber to deliver it to the next stage in said activated sludge process.

4,085,042
SOLID-FLUID CONTACTING PROCESS

Teruyuki Misumi; Toshio Miyaji, and Masao Kasai, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 607,693, Aug. 25, 1975, abandoned, which is a continuation of Ser. No. 447,633, Mar. 4, 1974, abandoned. This application Jun. 17, 1976, Ser. No. 697,117
Claims priority, application Japan, Mar. 3, 1973, 48-25519
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—33 **5 Claims**



1. In a solid fluid contacting process which comprises passing a fluid to be treated in one direction through a treatment zone which is initially substantially filled with active solid particles and regenerating the solid particles upon depletion of activity thereof by passing a regenerating fluid throughout said treatment zone in a direction opposite to the direction of flow of the fluid to be treated, the improvement which comprises removing from 5% to 50% by weight of the solid particles based on their total weight during the passage of the fluid to be treated through an outlet which is positioned upstream of the direction of flow of the fluid to be treated, transporting said removed solid particles to a backwash zone which is separate from the treatment zone, backwashing said removed solid particles and recycling the backwashed solid particles to the treatment zone to substantially fill said treatment zone with said solid particles prior to a subsequent treatment step.

4,085,043
CARBON CONTACT COLUMN

Norbert H. Ellis, Warminster, Pa., assignor to Met-Pro Systems, Inc., Lansdale, Pa.

Continuation of Ser. No. 569,534, Apr. 18, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,486
Int. Cl.[2] C02C *5/02*
U.S. Cl. 210—40 **10 Claims**

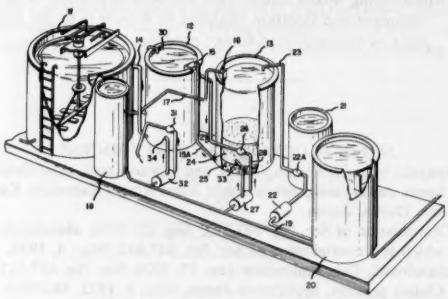
5. Apparatus for removing organic compounds from a stream of waste water comprising:

a plurality of tanks having substantially flat bottoms enclosing carbon contact columns mounted on a common base,

means for supplying said waste water stream to the bottom end of a first tank, means for removing treated water from the top end of each tank and supplying it to the bottom end of a succeeding tank,

means for supplying a source of carbon to the top end of the last succeeding tank,

means for removing carbon from each tank and means for supplying it to the top end of a preceding tank, and



a source of fluidizing water connected to an inlet in each tank adjacent to the means for removing carbon but not extending within said tanks.

4,085,044

TREATMENT OF LIME-SULFIDE TANNERY UNHAIRING WASTE

Michael Komanowsky, Philadelphia, and Howard I. Sinnamon, Jenkintown, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,274
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—45 **2 Claims**

1. In a process for treating lime-sulfide unhairing waste from salt-cured hides wherein undissolved lime is flocculated out of the waste, the supernatant liquid acidified to a pH below 4.0 to liberate H_2S, and the liberated H_2S absorbed in a caustic medium, the improvement which comprises flashing off the H_2S from the supernatant acidified liquid at a temperature of about from 100° to 150° F and under a vacuum of about from 10 to 29.9 inches of mercury and recovering a protein-rich solid from the flashed waste.

4,085,045

LOW MOLECULAR WEIGHT HYDROLYZED POLYACRYLAMIDE USED AS A SCALE INHIBITOR IN WATER SYSTEMS

Dae Suk Song, Wyckoff, N.J.; Richard Joseph Duffy, Greenwich, Conn.; Charles Richard Witschonke, Noroton, Conn.; Arthur Maurice Schiller, Stamford, Conn., and Mark Allan Higgins, Guilford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 586,765, Jun. 13, 1975, Pat. No. 4,001,161. This application Dec. 14, 1976, Ser. No. 750,488
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 **2 Claims**

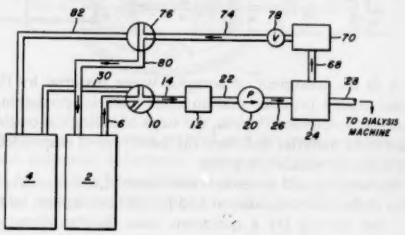
1. A process for inhibiting scale formation in a water system containing scale-forming salts comprising adding to said system from about 1 to about 100 parts per million of a hydrolyzed polyacrylamide having a molecular weight of 500–5000 and which is prepared by the process which comprises (1) charging to a reaction zone, equipped with a reflux condenser and containing water heated to reflux as the polymerization medium, simultaneously and continuously without external heating, separate streams of acrylamide, ammonium persulfate and a mercaptoalkanoic acid, the amounts by weight of ammonium persulfate and mercaptoalkanoic acid so charged being from about 0.05 to about 2 parts and from about 5 to about 20 parts, respectively, per 100 parts of acrylamide charged and the charging rates of the separate streams being controlled so that the introduction of all three streams starts and finishes substantially together and the heat of polymerization is sufficient to maintain reflux in the reaction zone without exceeding the capacity of the condenser to remove the heat of reaction, (2) applying heat to the reaction zone to maintain the refluxing towards the end of the addition of the three streams and (3) charging a sufficient amount of aqueous sodium hydroxide to hydrolyze from about 60% to about 90% of the amide groups of the polymer to carboxylate groups and provide a water solution of the hydrolyzed polymer product.

4,085,046

RENAL DIALYSIS CONCENTRATE DELIVERY SYSTEM

Thomas J. Saporito, Jr., 6060 Forest Hills Blvd., West Palm Beach, Fla. 33406

Filed Aug. 16, 1976, Ser. No. 714,601
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—90 **30 Claims**



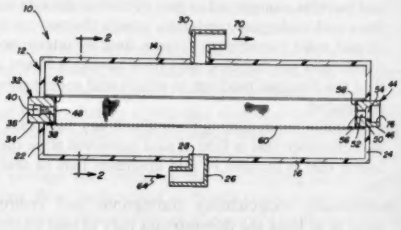
1. A renal dialysis concentrate delivery system comprising:
at least two renal dialysis concentrate reservoirs,
first supply valve means,
supply conduit means having first, second and third supply conduit means,
said first supply conduit means connecting a first said concentrate reservoir to said first supply valve means,
said second supply conduit means connecting a second said concentrate reservoir to said first supply valve means,
said third supply conduit means for transporting said concentrate from said first supply valve means to at least one renal dialysis machine,
said first supply valve means being a multiple position valve having a first position permitting flow of concentrate from said first concentrate reservoir through said first supply valve means, and a second position permitting flow from said second concentrate reservoir through said first supply valve means,
a concentrate pump in said third supply conduit means, and
return conduit means disposed downstream from said pump and connecting said third conduit means
with said concentrate reservoirs.

4,085,047

BLOOD LEAK DETECTOR

Lester E. Thompson, 10850 Kingsley Rd., Apt. 228, Dallas, Tex. 75238

Filed Sep. 16, 1976, Ser. No. 723,924
Int. Cl.[2] B01D *19/00*; G01J *3/50*
U.S. Cl. 210—96 M **6 Claims**



1. A blood leak detector comprising:

a housing including a top wall, a bottom wall, opposed side walls and opposed end walls;

means for preventing ambient visible light from entering the interior of said housing;

inlet means projecting into the interior of said housing through said bottom wall for directing fluid containing blood and gas bubbles into said housing;

oulet means contained within said top wall of said housing for directing fluid including blood and gas bubbles contained therein out of said housing through said top wall at a position located directly above the position of entry of said fluid into said housing through said inlet means;

means for generating a beam of light mounted in one of said end walls of said housing;

means for detecting said beam of light mounted in the other one of said end walls of said housing;

said light beam generating means and said light beam detecting means comprising axially aligned cylindrical plugs of substantially equal diameter mounted and contained within said opposed end walls of said housing;

screen means mounted within said housing extending between said axially aligned cylindrical plugs, dimensioned and oriented for mating with said cylindrical plugs to form a cylindrical configuration;

said screen means having spaced apart edges defining a slot therebetween mounted at the top of said cylindrical configuration to permit the escape of gas bubbles from the interior of said cylindrical configuration defined by said screen means extending between said cylindrical plugs; and

said screen means being positioned directly in the path of said fluid flowing from said inlet to said outlet, such that portions of said fluid pass through said screen means and through said beam of light while said gas bubbles contained within said portions of said fluid passing through said beam of light are separated from said fluid passing through said screen means and are prevented from entering said beam of light by flowing around the perimeter of said screen means without being removed from that portion of said fluid not passing through said beam of light.

4,085,048

DEVICE FOR SEPARATING FLUIDS AND A METHOD OF MANUFACTURING IT

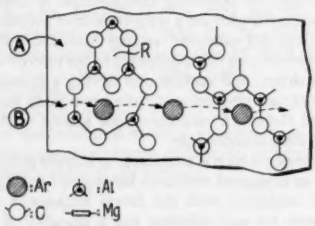
Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 453,156, Mar. 20, 1974, abandoned. This application Jun. 15, 1976, Ser. No. 696,427

Claims priority, application France, Mar. 23, 1973, 73.10562

Int. Cl.² B01D *53/22, 13/00*

U.S. Cl. 210—321 R **11 Claims**



1. A device for separating predetermined fluid species mixtures by diffusion through a plurality of thin non-porous layers disposed on porous walls, said non-porous layers fulfilling all the following conditions:

a. they are physically and chemically inert towards the substances to be separated;

b. they have an amorphous structure;

c. they have a cellular structure with cells on the same scale as the distances between atoms, the structure being homogeneous and isotropic inside the layers;

d. they enable the species to be separated to move from one cell to another by successive jumps, the jumps obeying the laws of diffusion or migration without any chemical bonds occurring between the moving substances and the interatomic network of the layer; and

e. they owe their cellular structure to the incorporation of elementary or complex particles in the layer.

4,085,049

SKIMMING APPARATUS

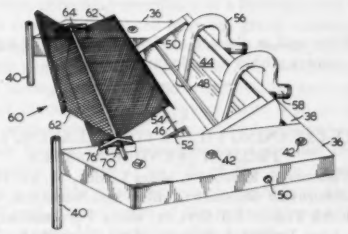
Norman John Reid Hartwick, and Donald Charles Clayton Lathe, both of Box 1994, Drayton Valley, Ontario, Canada

Filed May 4, 1976, Ser. No. 683,145

Claims priority, application Canada, Apr. 2, 1976, 245038

Int. Cl.² B01D *17/00*

U.S. Cl. 210—242 S **7 Claims**



1. A device for removing oil and like products from the surface of water comprising a spaced pair of float members; an elongated, open-sided reservoir having a weir edge extending substantially parallel with the reservoir longitudinal axis; and mounting means coupled to the longitudinal ends of said reservoir at a point between the reservoir longitudinal axis and the weir edge and rotatably mounting said reservoir on said float members to allow the depth of fluid within said reservoir to control the degree of rotation of said reservoir relative to said float members, whereby the rate of removal of skimmed fluid from the reservoir controls the depth of skim.

4,085,050

CONTINUOUS FILTER WITH CONTINUOUS CAKE REMOVAL

Enzo Gervasi, Viale Stazione, 13, Cervignano Del Friuli (Udine), Italy

Filed Jun. 21, 1976, Ser. No. 698,027

Claims priority, application Italy, Jul. 2, 1975, 46880 A/75

Int. Cl.² B01D *35/16*

U.S. Cl. 210—332 **7 Claims**

1. Filter unit comprising in combination:

an outer cylindrical casing,

at least one perforate inner cylindrical casing encircled by and spaced inwardly from said outer casing,

filter means carried on the inner surface of said inner casing,

a shaft positioned axially of said inner casing and mounted to rotate therewithin,

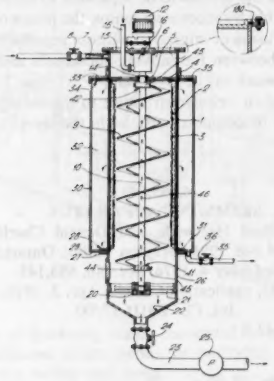
helical scraper means projecting radially from said shaft and attached thereto by means permitting adjustment of the distance between said scraper means and filter means, said scraper means terminating just short of said filter means,

inlet means for introducing a fluid to be filtered between said shaft and inner casing,

first outlet means for withdrawing filtered liquid from between said casings, and

second outlet means for withdrawing from within said inner

casing material which has been scraped from said filter by said scraper.



4. Filter unit as claimed in claim 1 comprising a plurality of inner casings within a single outer casing.

4,085,051

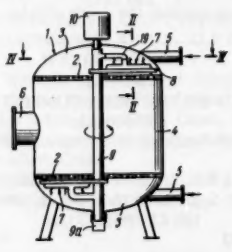
SELF-CLEANING FILTER FOR CLEANING LIQUIDS FROM SUSPENDED MATTER

Igor Viktorovich Kaminsky, ulitsa Lenina, 51, kv. 12; Vladimir Vladimirovich Shestakov, ulitsa Lesichanskaya, 41, kv. 30; Genrikh Fedorovich Severov, ulitsa Pervomaiskaya, 29, kv. 41; Aron Iosifovich Zaitsev, ulitsa Donetskaya, 58, kv. 40; Alexandr Fedorovich Litvinenko, ulitsa Sverdlova, 8, kv. 39, all of Severodonetsk Voroshilovgradskoi oblasti; Viktor Vasilievich Melnikov, ulitsa Dokuchaeva, 11, kv. 28; Boris Semenovich Zats, ulitsa Karpinskogo, 22, kv. 17, both of Penza; Mark Usherovich Miropolsky, ulitsa 3 Tverskaya-Yamskaya, 50, kv. 11, and David Lvovich Maizlik, Ljusinovskaya ulitsa, 72, kv. 89, both of Moscow, all of U.S.S.R.

Filed Feb. 26, 1976, Ser. No. 661,515

Int. Cl.[2] B01D *35/16*

U.S. Cl. 210—333 R **1 Claim**



1. A self-cleaning filter for cleaning liquids from suspended matter comprising: a container; at least two filtering partitions installed in said container; sections for contaminated liquid arranged parallel to each other and formed in said container by said filtering partitions; at least one section for cleaned liquid also formed in said contaminated liquid sections; pipe connections for delivering contaminated liquid into said sections and discharging the cleaned liquid; devices for backwashing the filtering partitions, each device being installed in one of said contaminated-liquid sections with a provision for moving over said filtering partition, each device having a mating plate pressed flexibly against said partition and having a hollow body communicating with the atmosphere and open at the side facing said filtering partition; said body having a circular recess at the opening side along the entire perimeter, the bottom wall of said recess having through holes; said mating plate being installed in said recess with means for upward movements therein so that there is a clearance between its face and the bottom wall of the recess, said clearance forming a chamber communicating with said contaminated-liquid section through the holes in the bottom wall of the recess; said device having a spring-biased duct pressed against the filtering partition by pressure of liquid admitted through ports and chamber in said hollow body, said duct being vertically movable relative to said filtering partition, said mating plate being movable directly over said filtering partition, said mating plate being comprised of elastic material, said filtering partitions comprising two perforated metal discs with filtering material therebetween, liquid being filtered through both filtering partitions simultaneously, said filtering partitions being cleaned with backflow of liquid only in areas covered by said ducts, cleaning occuring simultaneously with filtering over the remainder of the surface of said filtering partitions, the entire filtering surface area being washed successively when said ducts are moved, flexible hose means for removing suspended mechanical particles arrested by said filtering partitions, said flexible hose means connecting the interior spaces of said ducts to a hollow shaft.

4,085,052

FABRIC TREATMENT COMPOSITIONS

Alan Pearce Murphy; Paul Seiden, both of Cincinnati; Francis Louvaine Diehl, Wyoming, and Charles Bruce McCarty, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 543,606, Jan. 23, 1975, which is a continuation-in-part of Ser. No. 461,311, Apr. 16, 1974, abandoned. This application Oct. 8, 1976, Ser. No. 730,910

Int. Cl.[2] D06M *13/20*

U.S. Cl. 252—8.6 **18 Claims**

1. An article of manufacture adapted for providing fabric softening within an automatic clothes dryer, said article comprising:

(a) a fabric softening amount of softening composition containing a fatty alkyl sorbitan ester softener component selected from the group consisting of C_{10} to C_{26} fatty esters of sorbitan which contain free —OH groups and ethoxylates of said esters wherein one or more of the —OH groups in said esters contain from one to about six oxyethylene moieties, said composition having a melting point above about 38° C and being flowable at dryer operating temperatures; and

(b) a dispensing means which provides for release of said softening composition within an automatic laundry dryer at dryer operating temperatures, said dispensing means being selected from the group consisting of:

(1) a flexible absorbent substrate in a sheet configuration wherein the softening composition is affixed to the substrate to provide a weight ratio of softening composition to dry substrate ranging from about 10:1 to 1:1;

(2) A suction cup for attachment to the interior of the door of a dryer, said suction cup having a cylindrical body including a rib, and said cylindrical body having force-fitted thereon a cardboard tube coated with the fabric softening composition;

(3) A device which is attachable to a dryer drum, comprising an elongated container having an opening for filling said container with the fabric softener, a removable closure for said opening, and a plurality of spaced U-shaped clip means for attaching said container to said drum, said clip means embracing said container, said container having a surface, said container having a series of fluid discharge apertures extending through said surface, and a porous felt like nonmetallic covering secured to said container and overlying said apertures serving as a wick;

(4) A device comprising a body of synthetic plastic foamed material having a hollow center for containing

a core of the fabric softening composition, and a plurality of openings in said body, communicating with said hollow center, the core of the fabric softening composition extending integrally into said openings;

(5) A device held to the interior wall of a dryer drum in form-retaining relationship therewith, said device comprising a base having the fabric softening composition disposed on the exterior surface thereof, wherein on contact with tumbling fabrics in the dryer, the softening composition is removed from the base and deposited onto the fabrics, the said base comprising a flexible material and having a pressure-sensitive adhesive on the opposite surface thereof to effect said form-retaining relationship;

(6) A hollow sponge releasably enclosing enough softening composition to impart fabric softness during several cycles of clothes, and

(7) A bag made from a material selected from the group consisting of cloth and paper, said bag releasably enclosing said softening composition and being sealed with said sorbitan ester component of said softening composition.

4,085,053

METAL DITHIOPHOSPHATE PROCESS AND/COMPOSITION

Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 23, 1977, Ser. No. 799,673
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **40 Claims**

1. A lubricating oil composition comprising a major proportion of a lubricating oil and an effective amount of an oil soluble antiwear additive, said additive comprising a zinc, barium, cadmium, magnesium or nickel dithiophosphate, said dithiophosphate made by neutralization of dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel base in the presence of an acidic promoter followed by reacting a substantial portion of excess acidic promoter with a weak base.

15. A process for the manufacture of zinc, barium, cadmium, magnesium or nickel dithiophosphate comprising reacting phosphorus pentasulfide with one or more alcohols to form a dithiophosphoric acid; neutralizing said dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel base in the presence of an acidic promoter; and reacting a substantial portion of the excess acidic promoter with a weak base.

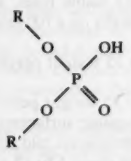
4,085,054

UTILIZATION OF ORTHOPHOSPHORIC ESTERS FOR THE PRODUCTION OF AQUEOUS FLUIDS FOR WORKING METALS

Giancarlo Bussi, Strada del Friuli, 85, and Pierpaolo Baradel, Via Navali, 32, both of Trieste, Italy

Division of Ser. No. 516,029, Oct. 18, 1974, Pat. No. 3,983,098. This application Jul. 2, 1976, Ser. No. 702,126
Claims priority, application Italy, Oct. 18, 1973, 30279/73
Int. Cl.[2] C10M *3/04*
U.S. Cl. 252—49.3 **10 Claims**

1. An aqueous composition for the working of metals, said composition comprising in solution in water between 20 and 70% of at least one alkali metal, ammonium or amine salt of an orthophosphoric ester of the formula:



in which R selected from the group consisting of chlorinated hydrocarbon groups and chlorinated COOH-containing hydrocarbon groups, said chlorinated hydrocarbon groups having a C_{10} to C_{20} carbon chain and at least two atoms of chlorine, and R′ is selected from the group consisting of hydrogen, chlorinated hydrocarbon groups and chlorinated COOH-containing hydrocarbon groups said chlorinated hydrocarbon groups having a C_{10} to C_{20} carbon chain and at least two atoms of chlorine and wherein R and R′ may be the same or different.

4,085,055

GRAFTED COPOLYMERS AND THEIR USE AS ADDITIVES FOR LUBRICATING OILS

Jean-Pierre Durand, Chatou; Patrick Gateau, Trappes; François Dawans, Bougival, and Bernard Chauvel, Ermont, all of France, assignors to Institut Francais du Petrole and Rhone Poulenc Industries, both of Rueil-Malmaison, France

Filed Dec. 3, 1975, Ser. No. 637,393
Claims priority, application France, Dec. 3, 1974, 74 39511
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—50 **11 Claims**

1. A graft copolymer of:

a. a substrate consisting essentially of a hydrogenated polymer or copolymer selected from the group consisting of (a) homopolymers of conjugated dienes having from 4 to 6 carbon atoms, (b) copolymers of at least two conjugated dienes having from 4 to 6 carbon atoms, (c) and copolymers of conjugated dienes having from 4 to 6 carbon atoms with styrene, said hydrogenated polymer or copolymer having after hydrogenation a residual olefinic unsaturation of from 0 to 5% of the units contained therein, a weight average molecular weight from 30,000 to 100,000 and a distribution of the molecular weights defined by a ratio M_w/M_n lower than 2, and

b. graft polymerized chains of at least one vinyl compound selected from the group consisting of N-vinylpyrrolidone, N-vinylimidazole and vinylpyridine.

9. A lubricating composition comprising a major proportion of lubricating oil and a proportion of at least one graft copolymer according to claim **1**, which is sufficient to improve both the viscosity index and the dispersing power of said lubricating oil.

4,085,056

INHIBITOR COMPOSITION CONTAINING AN OLIGOMER OIL

Thomas Anthony Schenach, Huntington Beach, Calif., assignor to Bray Oil Co. Inc., Los Angeles, Calif.

Filed Mar. 22, 1977, Ser. No. 780,029
Int. Cl.[2] C10M *1/30, 1/16;* **C07C** *3/18*
U.S. Cl. 252—59 **6 Claims**

1. A composition of matter, prepared by the following process:

(a) reacting a hydrogenated linear alpha-olefin oligomer oil with an alkyllithium compound having the formula $C_nH_{2n+1}Li$, wherein "*n*" is an integer between 1 and 20, at a temperature of from 60° F to about 230° F, the ratio of alkyllithium compound to oligomer oil being about 0.02 to about 0.7 moles per mole of oligomer;

(b) adding to the mixture of step (a) an alkyl iodide having the formula $C_mH_{2m+1}I$, wherein "*m*" is an integer of from 1 to 10, at a temperature of from about 60° F to about 140° F, the ratio of alkyl iodide to alkyllithium being about 1 to 1.25 moles of alkyl iodide per mole of alkyllithium;

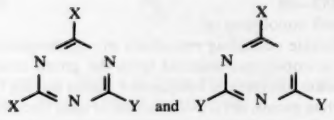
(c) cautiously hydrolyzing the mixture by the addition of water, and distilling to remove therefrom solvent and low-boiling byproducts, thereby obtaining said composition of matter, which is characterized by having viscosity properties similar to and improved thermal stability relative to the hydrogenated linear alpha-olefin starting material, and furthermore having the ability to inhibit the thermal decomposition of hydrogenated linear alpha-olefin oligomer oils when added in minor amounts thereto.

4,085,057
TONER FOR ELECTROSTATIC PRINTING OF SHEET LIKE MATERIALS CONTAINING TRIAZINE ANTISTATIC AGENT

Yougoro Masuda, Takatsuki, and Shigeru Kawase, Nara, both of Japan, assignors to Kanebo Ltd., Tokyo, Japan

Filed Feb. 19, 1976, Ser. No. 659,561
Claims priority, application Japan, Feb. 21, 1975, 50-22235
Int. Cl.[2] G03G 9/08
U.S. Cl. 252—62.1 P **6 Claims**

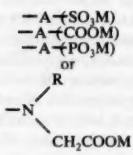
1. A toner for the electrostatic printing of a sheet-like material, which comprises a toner consisting essentially of at least one resin and at least one coloring matter, and a triazine derivative applied to the surface of or incorporated in said toner said triazine derivative being selected from those of the formulae:



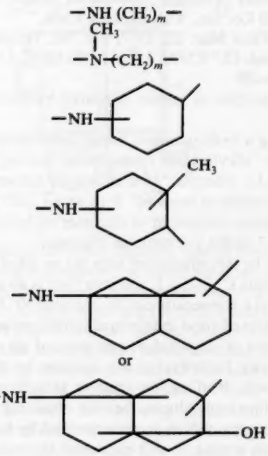
wherein

X is a halogen; and

Y is a radical of the formula:



wherein A is



R is hydrogen or alkyl having 1 to 18 carbon atoms;

M is hydrogen or an alkali metal atom;

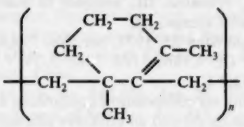
m is an integer of 1 to 5.

4,085,058
ELECTROPHOTOGRAPHIC LIQUID DEVELOPER CONTAINING A GRAFT COPOLYMER OF A CYCLIZED RUBBER

Syozo Adachi, and Masato Tamori, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 455,875, Mar. 28, 1974, abandoned. This application May 20, 1976, Ser. No. 688,263
Claims priority, application Japan, Apr. 4, 1973, 48-37869
Int. Cl.[2] G03G 9/12
U.S. Cl. 252—62.1 L **3 Claims**

1. A liquid developer for use in preparing a printing plate for an offset duplicator which comprises a dispersion of image-forming materials comprising finely divided colorant particles selected from a group consisting of dyes and pigments in a liquid carrier having an electrical resistivity of not less than 10^8 ohm-cm and a dielectric constant of not more than 3.0, said liquid carrier being at least one hydrocarbon selected from the group consisting of n-paraffinic hydrocarbons, iso-paraffinic hydrocarbons and their mixtures, characterized in that said image-forming material further comprises a graft copolymer of a cyclized rubber prepared from natural rubber onto which an ester of at least one acid selected from acrylic acid and methacrylic acid is grafted, said cyclized rubber having the recurring unit expressed by the structural formula



wherein

n is an integer such that said cyclized rubber has an average molecular weight of about 9,000 or greater and wherein said cyclized rubber has an average degree of cyclization in the range from about 20 to 80%, said ester being at least one compound selected from the group consisting of butyl acrylate, butyl methacrylate, 2-ethylhexyl acrylate, 2-ethylhexyl methacrylate, lauryl methacrylate, stearyl methacrylate, diethylaminoethyl acrylate and glycidyl methacrylate; and the amount of said graft copolymer being such that the ratio by weight of said graft copolymer to the colorant particles is within the range of 5/3 to 3/5, and the amounts of said ester and said cyclized rubber in the graft copolymer being 20 to 40% by weight and 60 to 80% by weight, respectively, based on the weight of the graft copolymer.

4,085,059
FOAM TYPE COATING REMOVER

Oliver Dale Smith, San Juan Capistrano, and Gerald M. Goldberg, Chatsworth, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 466,516, May 2, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,704
Int. Cl.[2] C11D 3/28, 7/32
U.S. Cl. 252—118 **4 Claims**

1. A substantially non-flammable, non-toxic, biodegradable liquid coating remover adapted when admixed with an inert gas to form a relatively stable foam, said liquid coating remover consisting essentially on a 100 total weight percent basis of:

(A) from about 5 to 35 weight percent of N-methyl-2-pyrrolidone,

(B) from about 30 to 85 weight percent water, and

(C) water soluble, organic surfactant material, said surfactant material comprising on said 100 total weight percent remover basis from about 5 to 15 weight percent of C_6 to C_{18} fatty acid materials selected from the group of acids consisting of lauric, myristic, palmitic, stearic, and mix-

tures thereof, from about 3 to 10 weight percent of C_2 to C_4 alkylol amines selected from the group consisting of mono-, di-, and tri-alkylol amines, and mixtures thereof, and from about 5 to 15 weight percent of C_3 to C_{18} polyhydric alcohols selected from the group consisting of glycerol, glycol, pentaerythritol, 1,2,3,4,5,6-hexanehexol, and mixtures thereof.

4,085,060
SEQUESTERING COMPOSITIONS

Neiko I. Vassileff, 9 Field End La., Eastchester, N.Y. 10709

Filed Sep. 23, 1975, Ser. No. 615,989
Int. Cl.[2] C02B *1/00, 5/00*
U.S. Cl. 252—180 **24 Claims**

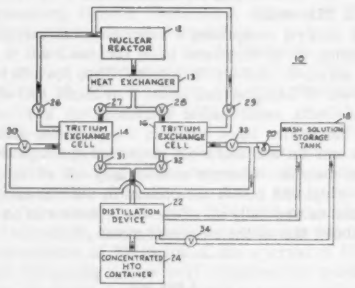
1. A metal sequestering composition capable of forming a stable aqueous solution and comprising a physical mixture of (a) from 5 to 95% by weight of at least one of a first water soluble polymer selected from the group consisting of polyacrylic acid and acrylic acid-maleic anhydride copolymer and (b) as the balance of said mixture, a second weight water soluble polymer which is polyethyleneimine.

19. A metal sequestering composition capable of forming a stable aqueous solution and comprising a physical mixture of (a) from 5 to 95% by weight of a first water soluble polymer which is polyacrylic acid and (b) as the balance of said mixture, a second water soluble polymer which is polyethyleneoxide.

4,085,061
TRITIATED WATER TREATMENT PROCESS

Charles J. O'Brien, Citrus Heights, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Continuation of Ser. No. 521,755, Nov. 7, 1974, abandoned. This application Jul. 26, 1976, Ser. No. 708,793
Int. Cl.[2] G21F *9/12;* **B01D** *59/00*
U.S. Cl. 252—301.1 W **9 Claims**



1. A method for removing tritium from water comprising the steps of:

bringing the water into contact with a water insoluble hydrophilic material that is more basic than the water and contains labile hydrogen atoms to provide an isotope exchange of tritium from the water to said water insoluble material;

bringing said water insoluble hydrophilic material into contact with a liquid that contains labile hydrogen atoms and is more basic than said water insoluble material to provide an isotope exchange of tritium from said water insoluble material to said liquid, said more basic property of said liquid causing a tritium concentration to form in said liquid that is greater than the tritium concentration in the water; and

separating the tritium from said liquid.

6. A system for removing tritium from water comprising:

means for bringing the water into contact with a water insoluble hydrophilic material that is more basic than the water and contains labile hydrogen atoms to provide an isotope exchange of tritium from said water to said water insoluble material;

means for bringing said water insoluble hydrophilic material into contact with a liquid that contains labile hydrogen atoms and is more basic than said water insoluble material to provide an isotope exchange of tritium from said water insoluble material to said liquid, said more basic property of said liquid causing a tritium concentration to form in said liquid that is greater than the tritium concentration in the water; and

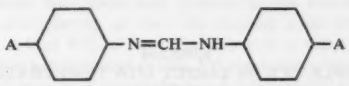
means for separating the tritium from said liquid.

4,085,062
N,N'-BIS-AROMATICFORMAMIDINES USEFUL AS SUNSCREENING AGENTS

Joseph A. Virgilio, Wayne, and Milton Manowitz, Fair Lawn, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Nov. 24, 1976, Ser. No. 744,856
Int. Cl.[2] F21V *9/06*
U.S. Cl. 252—300 **28 Claims**

1. An ultraviolet absorbing composition comprising an effective ultraviolet absorbing amount of a compound of the formula



wherein:

A represents —COOR, —COOH, —CONR'R, —NR'COR, —C≡N or a phenyl group

wherein:

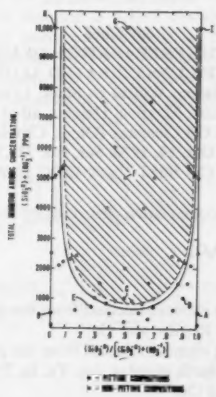
the R is an alkyl radical of from one to eight carbons and R' and R'' group may be the same or different and are chosen from the group consisting of hydrogen and lower alkyl radicals of from one to four carbons;

and at least one organic material subject to degradation by ultraviolet light.

4,085,063
NON-CHROMATE PITTING AND GENERAL CORROSION INHIBITORS FOR ALUMINUM PRODUCTS AND METHOD

Chia-tsun Liu, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 730,060, Oct. 6, 1976, abandoned. This application Mar. 3, 1977, Ser. No. 773,876
Int. Cl.[2] C23F *11/08;* **C09K** *3/00*
U.S. Cl. 252—387 **11 Claims**



1. An effective pitting and general corrosion inhibitor for a water-cooled system which includes aluminum water-cooled

members which have water-bearing channels formed therein, said inhibitor consisting essentially of an aqueous solution of water-soluble metasilicate and water-soluble nitrate, with a total anionic concentration of metasilicate ions plus nitrate ions being from about 750 ppm to about 10,000 ppm taken with respect to the water, with the concentration of said metasilicate ions and said nitrate ions being such that the total anionic concentration of said metasilicate ions versus the ionic ratio of

$$\frac{(SiO_3^{-2})}{(SiO_3^{-2}) + (NO_3^{-1})}$$

falls within the cross-hatched area in the graph as shown in the sole FIGURE of the drawing.

4,085,064

PURPLE $TiCl_3$ BY DIRECT LOW TEMPERATURE REDUCTION

Harry J. Wristers, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 12, 1975, Ser. No. 640,094
Int. Cl.[2] B01J *31/02*
U.S. Cl. 252—429 B **8 Claims**

1. In the process of preparing an olefin polymerization catalyst which comprises reducing $TiCl_4$ with AlR_nX_{3-n} where R is C_1 to C_{18}, n is 0 to 3, and X is F, Cl, Br or I and subjecting the resulting $TiCl_3$ catalyst to a Lewis base/$TiCl_4$ treatment to convert it to a purple crystallographic form to improve the efficiency and stereospecificity thereof, the improvement which comprises:

utilizing AlR_nX_{3-n}, where n = 1 to 1.95 and R is ethyl, in said reduction of $TiCl_4$, in greater than stoichiometric amounts where the molar ratio of AlR_nX_{3-n} to $TiCl_4$ is such that the ratio of n:$TiCl_4$ is between 1.0–4.5 at a temperature of from −30 ° C to about 30° C to produce a purple $TiCl_3$ catalyst prior to treatment with Lewis base/-$TiCl_4$, and utilizing in said Lewis base/$TiCl_4$ treatment, $TiCl_4$ in a concentration of about 5 to about 15 volume percent.

4,085,065

PROCESS FOR THE PREPARATION OF UNSATURATED ACIDS FROM UNSATURATED ALDEHYDES

James F. White, Akron; Wilfrid G. Shaw, Lyndhurst, and Michael D. Applequist, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company (Ohio), Cleveland, Ohio

Filed Oct. 19, 1976, Ser. No. 733,735
Int. Cl.[2] B01J *27/14;* **C07C** *51/24*
U.S. Cl. 252—437 **19 Claims**

1. The catalyst composition described by the formula

$$X_aY_bMo_{12}P_cAs_dO_x$$

wherein

X is at least one element selected from the group consisting of U, Ti, Nb, Re, Zn, and Ga;

Y is at least one element selected from the group consisting of Cu, a rare earth element, Ag, Ta, In, Th, Cd, Tl, NH_4, Cl, Ni, Al and Ge;

and wherein

a is 0.001 to 10;

b is 0 to 10;

c is 0.1 to 5;

d is 0.01 to 5;

x is the number of oxygens required to satisfy the valence states of the other elements present.

4,085,066

CATALYST COMPOSITION AND METHOD OF PREPARATION

Michael Gulla, Sherborn, Mass., assignor to Shipley Company Inc., Newton, Mass.

Division of Ser. No. 618,033, Sep. 30, 1975, Pat. No. 4,020,009. This application Nov. 12, 1976, Ser. No. 741,378
Int. Cl.[2] B01J *27/08, 27/10*
U.S. Cl. 252—434 **38 Claims**

1. A process for the formation of an essentially dry composition which, upon admixture with an aqueous hydrohalide acid solution having a pH less than 1, forms a stable colloidal catalyst solution for catalyzing a substrate prior to deposition of an electroless metal, said process comprising mixing powders of a catalytic metal halide with a stannous halide, said powders having been dampened with a hydrohalide acid, the molar ratio of the stannous content of the stannous halide to the catalytic metal content of the catalytic metal halide being at least 2:1, and permitting said mixture to stand until a color change occurs.

4,085,067

HYDROCARBON ISOMERIZATION CATALYST

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 633,889, Nov. 20, 1975, Pat. No. 4,013,738, which is a continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application Nov. 1, 1976, Ser. No. 737,468
The portion of the term of this patent subsequent to Feb. 22, 1974, has been disclaimed.
Int. Cl.[2] B01J *27/10*
U.S. Cl. 252—442 **11 Claims**

1. A catalyst comprising a halided porous carrier material containing, on an elemental basis, 0.01 to 2 wt. % platinum group metal, 0.1 to 5 wt. % cobalt, 0.01 to 5 wt. % tin and 0.1 to 10 wt. % halogen, and about 1 to about 100 wt. % of a Friedel-Crafts metal halide calculated on a Friedel-Crafts metal halide free basis, wherein the platinum group metal, cobalt and tin are uniformly dispersed through the porous carrier material, wherein substantially all of the platinum group metal and cobalt are present in the elemental metallic state and substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,085,068

HYDRODENITROGENATION AND HYDROCRACKING CATALYST

James P. Gallagher, Park Forest, and John Mooi, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 306,150, Nov. 13, 1972, abandoned, which is a division of Ser. No. 218,486, Jan. 17, 1972, Pat. No. 3,726,790, which is a continuation-in-part of Ser. No. 38,576, May 18, 1970, abandoned. This application Apr. 26, 1976, Ser. No. 680,319
Int. Cl.[2] B01J *29/06, 29/00, 29/10*
U.S. Cl. 252—455 R **12 Claims**

1. A composition of matter comprising a major amount of a catalytically-active support derived by the calcination of a material comprising from about 30 to about 70% by weight of silica and from about 30 to about 70% by weight of alumina, based on the total silica and alumina in said support, said silica and alumina being supplied by a mixture consisting essentially of from 40 to about 90% by weight of amorphous silica-alumina and from about 10 to about 60% by weight of alumina derived from hydrous alumina selected from the group consist-

ing of boehmite and mixtures of boehmite and amorphous hydrous alumina and minor catalytically effective amounts of both nickel and at least one metal selected from the group consisting of Group VIb metals and mixtures thereof.

4,085,069

HYDROTHERMALLY STABLE CATALYSTS CONTAINING AMMONIUM FAUJASITE ZEOLITES

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 718,167, Sep. 9, 1976. This application Aug. 27, 1976, Ser. No. 718,166

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **18 Claims**

1. A method of producing a cracking catalyst of ammonium zeolites of the faujasite type which comprises mixing a zeolite of the faujasite type whose exchange position is substantially entirely occupied by Na cations with a solution of an ammonium salt, the quantity of the zeolite, and the concentration of the ammonium cations, being in quantity sufficient to establish a ratio of the equivalents of NH_4 cation in the solution, per equivalent of Na cation in the zeolite in the mixture in excess of about 5, heating the solution to a temperature above about 300° and less than about 450° F. for a period of time to reduce the sodium content of the zeolite, expressed as Na_2O, in the range of from about 2.5% to about 0.5% by weight of the exchanged zeolite, on a volatile free basis, and washing the zeolite substantially free of anions of the salt in solution, mixing said zeolite with a matrix in water to form a slurry and spray drying the slurry.

4,085,070

PROCESS FOR THE PREPARATION OF AN OLEFIN-POLYMERIZATION CATALYST

Alfred Columberg, Geneva, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Jun. 18, 1976, Ser. No. 697,679

Claims priority, application Switzerland, Jun. 20, 1975, 008050/75; Feb. 27, 1976, 002415/76; Feb. 27, 1976, 002416/76

Int. Cl.[2] C08F *4/58, 4/52*

U.S. Cl. 252—429 R **10 Claims**

1. A process for preparing an olefin-polymerization catalyst which comprises reacting at least one acetate of an element of Group Ia, IIa or IIIa of the Periodic Table with at least one acyl group from an aliphatic carboxylic acid or an aliphatic carboxylic anhydride, heating the reaction mixture thus obtaining to a temperature of 70° to 100° C for a period of 10 to 30 hours, and eliminating excess acyl compound to produce a solid residue finely dispersable or soluble in an inert, anhydrous nonpolar organic solvent.

5. A process for preparing an olefin-polymerization catalyst which comprises reacting at least one acetylacetonate of an element from Group IIa or Group IIIa of the Periodic Table with at least one acyl group of an aliphatic carboxylic acid or an aliphatic carboxylic anhydride, heating the reaction mixture thus obtained to a temperature of 70° to 100° C for a period of 10 to 30 hours, and eliminating excess acyl compound to form a solid residue finely dispersable or soluble in an inert anhydrous nonpolar organic solvent.

7. A process for producing an olefin-polymerization catalyst comprising reacting at least one halogenide of an element of Group IVa or VI a of the Periodic Table with at least one acyl group from an aliphatic carboxylic acid or an aliphatic carboxylic anhydride, heating the reaction mixture thus obtained to a temperature of 70° to 100° C for a period of 10 to 30 hours, and eliminating excess acyl compound to produce a solid residue finely dispersable or soluble in an inert, anhydrous nonpolar organic solvent.

9. A process for preparing an olefin-polymerization catalyst which comprises reacting at least one oxyhalogenide of an element from Group Va of the Periodic Table with at least one acyl group from an aliphatic carboxylic acid or an aliphatic carboxylic anhydride, heating the reaction mixture thus obtained to a temperature of 70° to 100° C for a period of 10 to 30 hours, and eliminating excess acyl compound to produce a solid residue finely dispersable or soluble in an inert, anhydrous nonpolar organic solvent.

4,085,071

ION EXCHANGE POLYMER FILM, CONSISTING OF FLUORINATED POLYMER WITH N-MONOSUBSTITUTED SULFONAMIDO GROUPS METHOD AND APPARATUS FOR ELECTROLYSIS OF ALKALI OR ALKALINE EARTH METAL HALIDE

Paul Raphael Resnick, Wilmington, Del., and Walther Gustav Grot, Chadds Ford, Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 406,361, Oct. 15, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 623,920

Int. Cl.[2] C09D *3/78*

U.S. Cl. 260—22 R **19 Claims**

1. A film comprising a fluorine-containing polymer containing pendant side chains with sulfonyl groups attached to a carbon atom having at least one fluorine atom connected thereto, at least 40% of the sulfonyl groups in a first layer of said film in a thickness of at least 200 angstroms present as ion exchange sites as N-monosubstituted sulfonamido groups or salt thereof formed through reaction of $—SO_2X$ groups, where X is fluorine or chlorine, with a primary amine, and a second layer of said film having at least a majority of the sulfonyl groups present as ion exchange sites as $—(SO_2NH)_mQ$ or $—(SO_3)_nMe$ wherein Q is selected from the group consisting of H, NH_4, cation of an alkali metal, cation of an alkaline earth metal and combinations thereof, *m* is the valence of Q, Me is a cation and *n* the valence of the cation, and the amine is a diamine of the formula $NH_2(CH_2)_pNH_2$ with *p* an integer from 2 to 10, methyl amine, ethyl amine, butylamine, 2-methoxyethylamine or cyclohexylamine.

4,085,072

PROCESS FOR PREPARING OXIDATIVELY STABLE POLYURETHANE FOAM

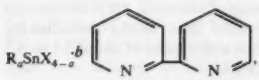
Robert V. Russo, Brooklyn, N.Y., assignor to M&T Chemicals Inc., Stamford, Conn.

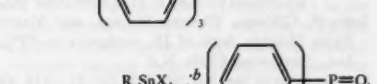
Filed Dec. 18, 1975, Ser. No. 641,963

Int. Cl.[2] C08G *18/24*

U.S. Cl. 260—2.5 AC **1 Claim**

1. A method for preparing an improved flexible cellular polyurethane by reacting a polyol containing at least two active hydrogen atoms per molecule, as determined by the Zerewitinoff method, with a polyfunctional isocyanate, the reaction being conducted in the presence of a blowing agent and an effective amount of a latent gel catalyst of a formula selected from the group consisting of





selected from the group consisting of alkyl containing from 1 to 20 carbon atoms, cycloalkyl and phenyl, X is selected from

the group consisting of chlorine, bromine, iodine, cyanate and thiocyanate and a and b are each 1 or 2.

4,085,073

STYRENE POLYMER FOAM AND THE PREPARATION THEREOF

Kyung W. Suh, and Graydon Wayne Killingbeck, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 628,618, Nov. 4, 1975, abandoned. This application Nov. 2, 1976, Ser. No. 737,887
Int. Cl.² C08J *9/14*
U.S. Cl. 260—2.5 E **12 Claims**

1. An alkenyl aromtic thermoplastic synthetic resinous elongate foam body having a machine direction and a transverse direction, the body defining a plurality of closed noninterconnecting gas containing cells therein, the cells having an average cell size of from about 1.2 to 3 millimeters, the foam body being a generally uniform cellular structure and being without discontinuities, being without substantial variation in average cell size when cell size is measured by averaging cell diameter across the minimum cross-sectional dimension of the body, the elongate body having a cross-sectional area of at least 18 square inches and having a minimum cross-sectional dimension of at least one inch, the foam body having a water vapor permeability not greater than 1.8 perm inches, a density of from about 1.4 to about 5 pounds per cubic foot the body being a continuous hardened thermoplastic gel with the further limitation that the cells contain a blowing agent having as a major component thereof at least 70 weight percent of a member selected from the group consisting of chlorofluoromethane, bromochlorodifluoromethane, and mixtures thereof.

4,085,074

PRE-MIXED CATALYZED VINYL ACETATE POLYMER ADHESIVE COMPOSITION

Ming Cho Woo, Willingboro, N.J., assignor to National Casein of New Jersey, Riverton, N.J.

Filed Mar. 29, 1976, Ser. No. 671,269
Int. Cl.² C08L *1/28*
U.S. Cl. 260—17 R **19 Claims**

1. A pre-mixed catalyzed adhesive composition comprised of (a) an aqueous cross-linkable vinyl acetate resin emulsion including polymerized vinyl acetate, in which the polymerized vinyl acetate is made from a monomer mixture of 80–97% vinyl acetate and 3–20% of a mixture of an alkyl ester of an acid selected from the class consisting of acrylic acid and methacrylic acid and an N-alkylol derivative of an amide of an alpha, beta-unsaturated carboxylic acid in an aqueous medium containing about 3–6% by weight of a hydrocolloid selected from the class consisting of polyvinyl alcohol, hydroxyethylcellulose and carboxymethylcellulose, by weight of the monomer mixture, (b) an acidic metal salt cross-linking catalyst selected from the class consisting of aluminum chloride, aluminum nitrate, chromic chloride and chromic nitrate in an amount of about 0.0032 to 0.025 gram equivalents per 100 grams of the resin emulsion, and (c) a cross-linking inhibitor selected from the class consisting of ammonia, alkyl amines and alkylol amines wherein the mole ratio of the cross-linking inhibitor to catalyst ranges from a minimum of about 0.1 to 0.2 to a maximum of about 0.7 to 1.7.

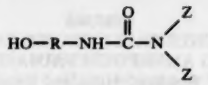
4,085,075

CARBOHYDRATE THERMOSET RESINS

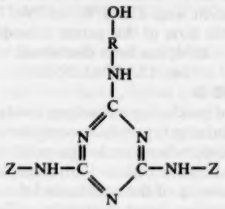
John P. Gibbons, Western Springs, and Mutong T. Chiang, Palos Heights, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 707,599, Jul. 22, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,396
Int. Cl.² C08L *3/02*
U.S. Cl. 260—17.2 **7 Claims**

1. A solid molding composition comprising:
(1) a phenol-formaldehyde novolak resin;
(2) a starch; and
(3) an aminoplast compatible with the starch selected from the group consisting of urea derivatives of the formula:



and melamine derivatives of the formula:



wherein R is a C_1 to C_3 alkylidene group and Z is hydrogen or C_1 to C_3 alkylol.

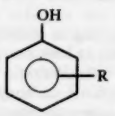
4,085,076

CARBOHYDRATE-BASED CONDENSATION RESIN

John P. Gibbons, Western Springs, and Lawrence Wondolowski, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 707,600, Jul. 22, 1976, Pat. No. 4,048,127. This application Jun. 21, 1977, Ser. No. 808,580
Int. Cl.² C08L *3/02*
U.S. Cl. 260—17.2 **12 Claims**

1. A process for producing a carbohydrate-phenolic resol resin which comprises the steps of:
a. reacting in the presence of an acid catalyst the following ingredients:
1. an aldose saccharide
2. a phenolic compound having the formula



wherein R is selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halogen, hydroxy and hydrogen, and
3. urea to form a liquid resin wherein the water produced in condensation is less than about 5 moles per mole of aldose; and
b. reacting said liquid resin with a lower aliphatic aldehyde in the presence of a basic catalyst to form said resol resin.

4,085,077

METHOD FOR STABILIZING VINYL CHLORIDE POLYMERS

Robert Dally Dworkin, Old Bridge, and Adam Joseph Ejk, Piscataway, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,478
Int. Cl.² C08K *5/57*
U.S. Cl. 260—23 XA **14 Claims**

1. A method for improving the resistance to heat induced discoloration, decomposition and odor imparted to vinyl chloride polymer and acrylonitrile-butadiene-styrene terpolymers by a diorganotin compound selected from the group consisting

of reaction products of mono- or dicarboxylic acids containing from 4 to 20 carbon atoms or anhydrides of said acids with a diorganotin oxide containing from 2 to 24 carbon atoms, wherein the number of moles of diorganotin oxide reacted is from 1.0 to 2.0 times the number of equivalents of acid or anhydride, the method consisting essentially of combining said diorganotin compound with an unreacted mono- or dicarboxylic acid containing from 8 to 20 carbon atoms or an anhydride of said acid, wherein said unreacted acid or anhydride constitutes from 1 to 90% of the combined weight of the acid or anhydride and the reaction product, the carboxylic acid that is reacted with the diorganotin oxide exhibits the formula

or HOOCR"COOH wherein R' represents alkyl, cycloalkyl, aryl, alkaryl or aralkyl and contains from 1 to 12 carbon atoms and wherein the hydrocarbon portion of said unreacted acid or anhydride contains from 8 to 20 carbon atoms in a cyclic, linear or branched configuration and no substituents which are reactive with said diorganotin oxide.

4,085,078

LOW VISCOSITY ASPHALT-RUBBER PAVING MATERIAL

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Filed Dec. 27, 1976, Ser. No. 754,446
Int. Cl.[2] C08L *95/00*
U.S. Cl. 260—28.5 AS **12 Claims**

1. In a method for surfacing and repairing broken pavement with an elastomeric paving material, said material comprised of reaction product formed by endothermically reacting a mixture of a paving grade asphalt and a non-oil resistant rubber, the improvement comprising the step of admixing at least one diluent selected from the group consisting of petroleum fractions distilled from crude oil at a temperature of from about 174° to about 325° C. with said asphalt and said rubber prior to forming said reaction product, said diluent being admixed in an amount of from about 1 to about 15 percent by weight of said asphalt-rubber mixture, whereby the viscosity of said reaction product is reduced to at least about one half as compared to the viscosity of said reaction product having said diluent admixed after the formation thereof.

4,085,079

FORMALDEHYDE SOLUTIONS STABILIZED WITH INTERPOLYMERS OF VINYL ACETATE, VINYL ACETAL AND VINYL ALCOHOL

Richard C. Kmetz, Longmeadow, and Leland P. Miner, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 2, 1977, Ser. No. 764,784
Int. Cl.[2] C07C *47/04*
U.S. Cl. 260—29.6 B **9 Claims**

1. A process of stabilizing an aqueous formaldehyde solution comprising dissolving an interpolymer of vinyl acetate, vinyl alcohol and vinyl acetal in an organic solvent and admixing the solution of the interpolymer with the formaldehyde solution to form a stabilized formaldehyde solution containing at least 1 p.p.m. of the interpolymer by weight, wherein the interpolymer comprises from about 25 to about 65 parts by weight of vinyl acetate units, from 3 to about 15 parts by weight of vinyl alcohol units and from about 20 to about 72 parts by weight of vinyl acetal units and wherein the interpolymer is the alcoholysis and acetalization product of a polyvinyl acetate of weight average molecular weight in the range of about 2000 to about 60000.

4,085,080

NYLON COMPOSITION CONTAINING NON-POLAR ESTER PLASTICIZER

Donald Lee Elbert, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 536,670, Dec. 26, 1974, Pat. No. 4,006,115. This application Nov. 19, 1976, Ser. No. 743,270
Int. Cl.[2] C08J *3/18*
U.S. Cl. 260—31.2 N **11 Claims**

1. A composition of matter comprising a nylon resin, an additive insoluble in the nylon resin selected from the group consisting of fillers and flame retardant synergists, and from .1 to 10 percent by weight of an ester selected from the group consisting of adipates and sebacates of a C_4 to C_{12} alkyl or cycloalkyl alcohol or a phenol and fatty acid esters of pentaerythritol.

4,085,081

"SMOKE-SUPPRESSANT POLYHALOCARBON POLYMER COMPOSITIONS CONTAINING AS PLASTICIZER AN UNSATURATED DERIVATIVE OF AN ESTER POLYOL"

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 4, 1977, Ser. No. 765,638
Int. Cl.[2] C08K *5/10*
U.S. Cl. 260—31.4 R **9 Claims**

1. A smoke-suppressant polyhalocarbon composition comprising a polyhalocarbon resin and from 1 to 80 parts by weight based on 100 parts of polyhalocarbon resin of an organic ester of the formula:

$$RC(CH_2O)_3(CH_2CH{=}CH_2)_{3-x}(C(O)CH_3)_{3-y}$$

where R is C_1 to C_8 alkyl, C_6 to C_{12} cycloalkyl, or C_1 to C_8 alkoxy-substituted C_1 to C_8 alkyl, and x and y are 1 or 2 with the proviso that $x \neq y$.

4,085,082

POLYMERS OF VINYL ACETATE PLASTICIZED WITH LOW MOLECULAR WEIGHT POLYESTERS

Frank Lamb, Oldham; Malcolm Combey, Mellor, and Hugh Melvin Cooper, Cheadle, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 406,175, Oct. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,625, Oct. 26, 1971, abandoned. This application Aug. 7, 1975, Ser. No. 602,889
Claims priority, application United Kingdom, Oct. 27, 1970, 50906/70
The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.
Int. Cl.[2] C08K *5/11;* **C08L** *31/04*
U.S. Cl. 260—31.6 **5 Claims**

1. A composition comprising a vinyl acetate polymer or copolymer of between 55% and 100% of vinyl acetate with one or more ethylenically unsaturated non-halogenated comonomers and from 10 to 100% by weight based on the weight of the polymer of a polyester having a molecular weight of from 350 to 1500 derived from the reaction of glutaric acid or anhydride or a mixture of aliphatic dibasic acids of anhydrides selected from succinic, glutaric or adipic acid or anhydride with ethylene glycol and an aliphatic alcohol containing from 3 to 6 carbon atoms; wherein the alcohol and glycol components are reacted with the dibasic acids or anhydrides in the theoretical amounts needed to effect the reaction with the proviso that the glycol may be reacted with the dibasic acids or anhydrides in amounts ranging from 0–10 mol% below the theoretical amount necessary to effect the reaction to up to 20% in excess of the theoretical amount necessary to effect the reaction to up to 20% in excess of the theoretical amount and the alcohol may be reacted with the dibasic acids or anhy-

drides in amounts ranging from 0 to 50 mol% below the theoretical amount to up to 20 mol% in excess of the theoretical amount needed to produce the final product.

4,085,083

PLASTICIZED POLYMERS OF VINYL ACETATE

Frank Lamb, Oldham; Malcolm Combey, Mellor, and Hugh Melvin Cooper, Cheadle, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 406,175, Oct. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,625, Oct. 26, 1971, abandoned. This application Aug. 7, 1975, Ser. No. 602,887

Claims priority, application United Kingdom, Oct. 27, 1970, 50906/70

Int. Cl.² C08K *5/11*

U.S. Cl. 260—31.6 **7 Claims**

1. A composition comprising a vinyl acetate homopolymer or copolymer, made up of at least 55% of a vinyl acetate monomer and the remainder being one or more ethylenically unsaturated non-halogenated comonomers, and from 10 to 100% by weight based on the weight of the polymer of a polyester having a molecular weight from 350 to 1500 derived from the reaction of an acid or anhydride selected from succinic, glutaric or adipic acid or anhydride, or any mixture thereof, a polyethylene glycol having a molecular weight of from 175 to 225 and an aliphatic alcohol containing from 3 to 6 carbon atoms, said glycol and alcohol being reacted with the acid or anhydride in the theoretical amounts necessary to effect the reaction with the proviso that the glycol may be reacted with the acid or anhydride in amounts ranging from 0–10 mol % below the theoretical amount necessary to effect the reaction to up to 20% in excess of the theoretical amount and the alcohol may be reacted with the acid or anhydride in amounts ranging from 0 to 50 mol % below the theoretical amount to up to 20 mol % in excess of the theoretical amount needed to produce the final product.

4,085,084

SILICONE RESINS HAVING GOOD THERMAL STABILITY

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Aug. 26, 1976, Ser. No. 717,973

Int. Cl.² C08K *5/01*

U.S. Cl. 260—33.6 SB **18 Claims**

1. A process for preparing a difunctional silicone resin having good thermal stability comprising

a. hydrolyzing a diorganodihalosilane in a heterogeneous hydrolysis mixture having:

1. from about 1.7 parts to about 10 parts by weight of water, per part of silane,
2. from about 0.2 to about 5 parts by weight of acetone per part of silane
3. from about 0.3 to about 5 parts by weight of water-immiscible organic solvent per part of silane, and
4. from 0 to about 1 mole aliphatic monohydric alcohol having from 1 to 8 carbon atoms per mole of halogen attached to the silicone atom of said silane, wherein said hydrolysis must take place within 10 minutes and

b. separating the water layer from the organic solvent layer which contains the resin wherein said organo groups of said diorganodihalosilane are methyl and phenyl and the halo is chlorine and in said organo groups the methyl concentration varies from 40 to 60 mole percent.

10. A silicone resin mixture with thermal stability up to 700° F comprising mixing a first silicone resin which is the silicone resin produced by the process of claim 1 with a second silicone resin produced by (a) hydrolyzing an organohalosilane in an heterogeneous hydrolysis mixture composed of:

1. from about 1.7 parts to about 10 parts by weight of water per part of halosilane,
2. from about 0.2 to about 5 parts by weight of acetone per part of halosilane,
3. from about 0.3 to about 5 parts by weight of a water-immiscible organic solvent, per part of halosilane, and
4. from 0 to about 1 mole of an aliphatic monohydric alcohol having from 1 to 8 carbon atoms, per mole of halogen attached to the silicone atom of said halosilane, and (b) separating the second silicone resin organic solvent layer from the acid/water layer where said organohalosilane consists of methyltrichlorosilane and phenyltrichlorosilane where the concentration of the methyltrichlorosilane in the total trichlorosilane varies from 20 to 80 mole percent and further consists of dimethylchlorosilane and diphenylchlorosilane where the concentration of dimethylchlorosilanes varies from 20 to 80 mole percent in the total dichlorosilanes.

12. The silicone resin mixture of claim 10 wherein said process for said second silicone resin further comprises heating the second silicone resin organic solvent layer to 120°–140° C to remove solvent adding diatomaceous earth to said second silicone resin and organic solvent and heating to a temperature in the range of 190°–240° C to remove solvent and water and to body said silicone resin until it has a silanol content of 2 to 4% by weight and finally neutralizing said second silicone resin until it has an acid content that does not exceed 10 ppm.

13. The silicone resin mixture of claim 12 wherein said silicone resin mixture is at 50–90% by weight solids content in an organic solvent selected from the class consisting of xylene, toluene, benzene, cyclohexane, heptane and octane.

4,085,085

CURABLE COATING COMPOSITIONS

Shozo Tsuchiya, Kawasaki; Hideo Hayashi, Yokohama; Kazuyoshi Iida, and Kiyoshi Goto, both of Tokyo, all of Japan, assignors to Nippon Oil Company, Limited, Japan

Filed Dec. 28, 1976, Ser. No. 754,983

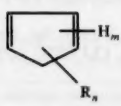
Claims priority, application Japan, Jan. 1, 1976, 51-329

Int. Cl.² C08L *61/14, 9/00, 29/06*

U.S. Cl. 260—38 **11 Claims**

1. A curable coating composition comprising a resin obtained by reacting the following ingredients (A), (B) and (C)

(A) at least one member selected from the group consisting of (1) five-membered cyclic compounds having unsaturated conjugated double bonds, represented by the following general formula



wherein R is an organic residue having 1 – 3 carbon atoms, and *m* and *n* are each an integer with the proviso that the sum thereof is 6 and (2) Diels-Alder's products of the five-membered cyclic compounds (1)

(B) at least one compound containing both a polymerizable double bond and a hydroxyl group in the molecule, and

(C) at least one resol type phenolic resin, to produce a hydroxyl group-containing resin, and then reacting the thus-produced hydroxyl group-containing resin with a member selected from the group consisting of acrylic and methacrylic acids.

4,085,086

PROCESS FOR PREPARING FLAME RETARDANT THERMOPLASTIC POLYESTERS

Shioji Mizuno, Osaka; Ryoichi Ishikawa, Izumi-ohtsu, and Mitsumasa Miyazaki, Sakai, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 607,890
Int. Cl.[2] C08G *63/76;* C08K *3/40*
U.S. Cl. 260—40 TN 12 Claims

1. A process for preparing a flame retardant thermoplastic polyester molding resin which comprises reacting in the presence of a reinforcing agent a low molecular weight polyester having terminal hydroxyl groups with a polyfunctional isocyanate, said low molecular weight polyester being one synthesized using as its acid component a compound selected from the group consisting of terephthalic acid and its lower alkyl esters of 1–4 carbon atoms and as its alcohol component 1,4-butanediol and a compound selected from the group consisting of an alkylene oxide adduct of 2–4 carbon atoms of tetrabromobisphenol A and an alkylene oxide adduct of 2–4 carbon atoms of tetrachlorobisphenol A.

4,085,087

METHOD OF REDUCING STATIC ELECTRICITY IN PLASTIC COMPOSITIONS AND ANTISTATIC COMPOSITIONS

Günter Kratel, Durach-Bechen; Johann Bauer; Engelbert Pichler, both of Burghausen, and Hans-Peter Kalmuk, Kempten, all of Germany, assignors to Wacker Chemie GmbH, Munich, Germany

Filed Sep. 5, 1975, Ser. No. 610,535
Claims priority, application Germany, Sep. 9, 1974, 2443075
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—42.49 24 Claims

1. In the method of reducing the electrostatic charge acquired by a plastic composition comprising the step of incorporating an antistatically-effective amount of an antistatic agent in said plastic composition, the improvement consisting essentially of using an antistatically-effective amount of a mixed oxide of phosphorus and one or more metals selected from the group consisting of silicon, aluminum, titanium and iron, said mixed oxide having been prepared by flame hydrolysis and having a BET surface area of from 15 to 400 m^2/gm, as said antistatic agent.

4,085,088

FIRE-RETARDING THERMOPLASTIC RESIN COMPOSITION

Shigeo Miyata, Takamatsu; Toru Hirose, Ohkawa, and Noriko Iizima, Takamatsu, all of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1976, Ser. No. 753,087
Claims priority, application Japan, Jan. 23, 1976, 51-5903
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—45.7 R 8 Claims

1. A fire-retarding thermoplastic resin composition comprising

A. a thermoplastic resin, and

B. a fire-retarding amount of a hydrotalcite having a specific surface area, determined by the BET method, of not more than 30 m^2/g, the hydrotalcite being uncoated, or coated with an aqueous solution of an anionic surface active agent in a concentration of not more than 20 millimoles/liter in a thickness larger than a monolayer but up to a triple layer.

4,085,089

BENZOTRIAZOLE ULTRAVIOLET STABILIZING COMPOUNDS AND THEIR USE IN ORGANIC COMPOSITIONS

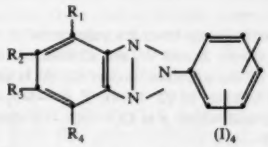
Gether Irick, Jr.; Charles A. Kelly, and James C. Martin, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1976, Ser. No. 715,013
Int. Cl.[2] C08K *5/34*
U.S. Cl. 260—45.8 NT 52 Claims

1. An organic composition susceptible to ultraviolet light degradation stabilized against such degradation with a stabilizing amount of at least one bichromophoric compound having the formula:

A—B—C

wherein A is a group having the structure

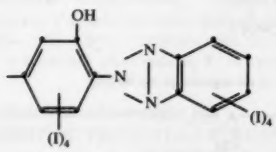


wherein

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo, lower alkyl, substituted lower alkyl, cyclohexyl, substituted cycloalkyl, phenyl, substituted aryl, lower alkylaryl, aryl-substituted-aryl, alkoxy, substituted amino, carboalkoxy and the substituents R_1 and R_2, R_2 and R_3, and R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4;

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the heterocyclic ring and the carbon atom attached to the B group connecting the heterocyclic aromatic A group with the aromatic C group, wherein B is a linking group connecting A and C and is oxy, carbonyloxy, oxycarbonylalkyleneoxy, alkyleneoxycarbonyloxy, oxyalkylenecarbonyloxy, oxycarbonyloxy, alkyleneoxy, oxyalkylene, alkyleneoxyalkyleneoxy, oxyalkylenearylenealkyleneoxy, thio, thioalkyleneoxy, sulfinyldioxy, oxy(alkoxy)phosphinooxy, carbonylamino, N-alkylcarbonylamino, N-arylcarbonylamino, aminocarbonylalkyleneoxy, N-alkylaminocarbonylalkyleneoxy, N-arylaminocarbonylalkyleneoxy, aminocarbonylamino, N-alkylaminocarbonylamino, N-alkylamino, N-arylamino, N-alkylaminoalkyleneoxy, N-arylaminoalkyleneoxy, oxyalkyleneoxy, oxyaryleneoxy; and

wherein C is a group having the formula



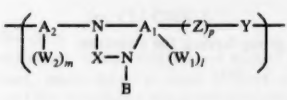
where I is the same substituent as listed above and is present in all positions of the benzenoid rings except the carbon atom attached to the B group connecting the A and C moieties, and said I substituents can all be one of the substituents listed above or different listed substituents.

4,085,090
AROMATIC POLYMERS CONTAINING A NITROGEN-CONTAINING RING GROUP, AND PROCESS FOR PREPARATION THEREOF

Shigeyoshi Hara, Hino; Masao Senoo, Ehime; Koh Mori, and Yutaka Taketani, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 29, 1975, Ser. No. 581,933
Claims priority, application Japan, May 31, 1974, 49-60964
Int. Cl.[2] C08G *71/04, 73/18, 73/06*
U.S. Cl. 260—49 **25 Claims**

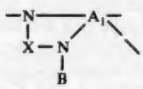
1. A nitrogen-containing aromatic polymer comprising at least 30 mol%, based on the entire recurring units, of at least one recurring unit of the following formula



(I)

wherein A_1 is an aromatic group having a valence of (3 + 1), and the two nitrogen atoms, Z and W_1 are all bonded to the nuclear carbon atoms of the aromatic group A_1; A_2 is an organic group having a valence of (2 + *m*); Z is $-SO_2-$ or —CO—; *p* is O or 1, and when *p* is O, $-A_1-$ is directly bonded to Y; Y is —O— or

in which R_1 is a hydrogen atom or a monovalent hydrocarbon residue, and the two nitrogen atoms bonded to A_1 are bonded to the nuclear carbon atoms at the ortho-position of the aromatic group A_1; B is a hydrogen atom or a bond with X in which case N-X forms a double bond; said atomic grouping (a)

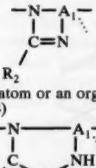


(a)

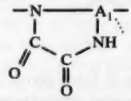
wherein the dotted line represents the presence or absence of a bond forms a 5- or 5-membered ring through one or two carbon atoms selected from the group consisting of:

(a-1) (benzimidazolone ring)

(a-2) (benzimidazolthione ring)

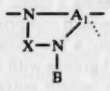
(a-3)  (benzimidazole ring)

(R_2 is a hydrogen atom or an organic group having a valence of 1 to 4)

(a-4)  (quinoxalidinedione ring);

l and *m* are identical of different and each represent an integer of 0 to 3; when *p* is O, Y is

and one of W_1 groups is bonded to the nuclear carbon atom at the ortho-position of the aromatic group A_1 together with Y, the W_1, Y and A_1 can form a 5-membered or 6-membered ring same as



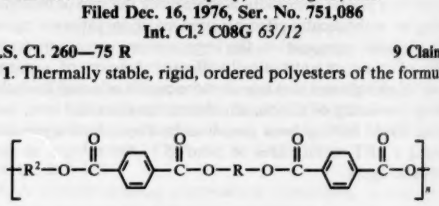
in which all symbols are the same as defined above and the dotted line represents the presence or absence of a bond; and when W_1 does not form the 5- or 6-membered ring, W_1 and W_2 are identical or different and represent at least one group selected from a primary amino group and mono- or di-substituted nitrogen-containing group derived from the primary amino group.

4,085,091
THERMALLY STABLE, RIGID POLYESTERS FROM THERMALLY STABLE, RIGID DIBASIC ACIDS AND AROMATIC DIHYDROXY COMPOUNDS

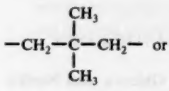
August Henry Frazer, Wilmington, Del., assignor to E. I. Du-Pont de Nemours and Company, Wilmington, Del.

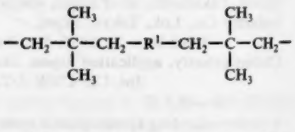
Filed Dec. 16, 1976, Ser. No. 751,086
Int. Cl.[2] C08G *63/12*
U.S. Cl. 260—75 R **9 Claims**

1. Thermally stable, rigid, ordered polyesters of the formula



where R is

 or



where

R^1 is an arylene selected from the group consisting of 1,4-phenylenes, 4,4'-biphenylenes and 2,6-naphthylenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl,

R^2 is an arylene selected from the group consisting of 1,4-phenylenes, 4,4'-biphenylenes and 2,6-naphthalenes, said arylene being unsubstituted or substituted with halo, lower alkyl or phenyl, and

n is at least 10.

4,085,092
TRANSPARENT, OPTICALLY CLEAR POLY(LACTONE-URETHANE) INTERLAYERS FOR LAMINATED SAFETY GLASS

Wen-Hsuan Chang, Gibsonia, and Vernon G. Ammons, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 474,645, May 30, 1974, Published Application No. B 474,645, abandoned. This application Sep. 30, 1976, Ser. No. 728,372

Int. Cl.[2] C08G *18/64, 18/65, 18/75;* **B32B** *27/40*

U.S. Cl. 260—77.5 AN **17 Claims**

1. A non-blooming energy-absorbing polyurethane interlayer comprising the polymerizate of:

(A) an organic polyisocyanate,

(B) a polylactone polyol having a hydroxyl number within the range of 62 to 140 inclusive formed from polymerizing an unsubstituted lactone having 6 to 8 carbon atoms with an organic polyhydroxyl-containing compound selected from the class consisting of:

(1) aliphatic diols free of alkyl substitution and oxyalkylated products of these diols,

(2) a hydroxyl-terminated polyester having a hydroxyl number below 600 formed from an organic polycarboxylic acid containing from 3 to 10 carbon atoms and aliphatic diols free of alkyl substitution and oxyalkylated products of these diols,

(C) a compound containing at least two active hydrogens per molecule reactive with the isocyanate group having a molecular weight less than 250 selected from the class consisting of aliphatic diols free of alkyl substitution, aliphatic triols and mixtures thereof; the equivalent ratio of (A)/(B)/(C) being within the following range: 1.35-4.4/1.000/0.5-3.

17. The polyurethane interlayer of claim 1 which has a mean penetration velocity at 0° F., 70° F. and 120° F. (−18° C., 21° C. and 49° C.) of at least 20 miles per hour (32.180 km/hr) when an approximately 0.030–0.040 inch (0.0762×10^{-2} to 0.1016×10^{-2} m) thick sample of the polyurethane interlayer is laminated to a $\frac{1}{8}$ inch (0.3175×10^{-2} m) thick 12 inch by 12 inch (30.48×10^{-2} m by 30.48×10^{-2} m) float glass sheet to form a bilayer laminate and the laminate held rigid and impacted on the polyurethane side with a 5-pound (22.675×10^{-1} kg) freely falling steel ball.

4,085,093
SULFILIMINES AS PREMATURE VULCANIZATION INHIBITORS

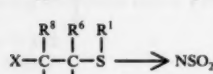
Roger J. Hopper, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 23, 1976, Ser. No. 707,970

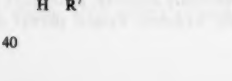
Int. Cl.[2] C07C *143/72, 143/84;* **C08F** *28/00*

U.S. Cl. 260—79.5 P **7 Claims**

1. A composition comprising a sulfur vulcanizable rubber containing in a retarding amount at least one retarder conforming to one of the following structural formulae:

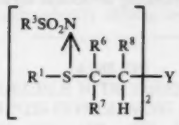


(I)



(II)

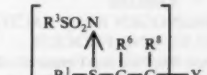
-continued



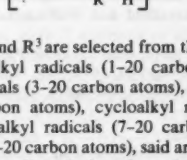
(III)

wherein R^1 and R^3 are selected from the group consisting of primary alkyl radicals (1–20 carbon atoms), secondary alkyl radicals (3–20 carbon atoms), tertiary alkyl radicals (4–20 carbon atoms), cycloalkyl radicals (5–20 carbon atoms), aralkyl radicals (7–20 carbon atoms), and aryl radicals (6–20 carbon atoms), said aralkyl and aryl radicals being optionally substituted on the ring by one or two alkyl (1–4 carbon atoms), alkoxy (1–4 carbon atoms), halo or nitro groups, wherein R^2 is selected from the group consisting of primary alkyl radicals (2–20 carbon atoms), secondary alkyl radicals (3–20 carbon atoms), tertiary alkyl radicals (4–20 carbon atoms) and cycloalkyl radicals (5–20 carbon atoms), wherein R^5 is selected from the group consisting of primary alkyl radicals (2–20 carbon atoms), secondary alkyl radicals (3–20 carbon atoms), and cycloalkyl radicals (5–20 carbon atoms), wherein R^6, R^7, and R^8 are selected from the group consisting of hydrogen and primary alkyl radicals (1–4 carbon atoms), wherein X is selected from the group consisting of —CN, $—CO_2R^3$, $—CO_2NH_2$,$—CO_2NHR^3$, $—CO\ N(R^1)_2$,$—C(O)R^3$ and SO_2R^3, and wherein Y is selected from the group consisting of —C(O)— and $—SO_2—$ radicals, with the proviso that in (II) and (III) when R^1 is a tertiary alkyl radical, R^7 is hydrogen.

7. A compound conforming to one of the following structural formulae:



(II)



(III)

wherein R^1 and R^3 are selected from the group consisting of primary alkyl radicals (1–20 carbon atoms), secondary alkyl radicals (3–20 carbon atoms), tertiary alkyl radicals (4–20 carbon atoms), cycloalkyl radicals (5–20 carbon atoms), aralkyl radicals (7–20 carbon atoms), and aryl radicals (6–20 carbon atoms), said aralkyl and aryl radicals being optionally substituted on the ring by one or two alkyl (1–4 carbon atoms), alkoxy (1–4 carbon atoms), halo or nitro groups wherein R^6, R^7 and R^8 are selected from the group consisting of hydrogen and primary alkyl radicals (1–4 carbon atoms), wherein X is selected from the group consisting of —CN, $—CO_2R^3$, $—CO_2NH_2$, $—CO_2NHR^3$, $—CO_2N(R^1)_2$, $—C(O)R^3$ and SO_2R^3, and wherein Y is selected from the group consisting of —C(O)— and $—SO_2—$ radicals with the proviso that when R^1 is a tertiary alkyl radical, R^7 is hydrogen.

4,085,094
INHIBITING PREMATURE VULCANIZATION OF RUBBERS

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

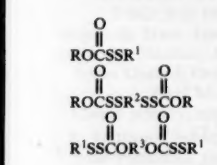
Filed Oct. 1, 1976, Ser. No. 728,693

Int. Cl.[2] C08F *19/20*

U.S. Cl. 260—79.5 B **5 Claims**

1. A composition comprising a vulcanizable diene polymer

containing a sulfenylthiocarbonate selected from the group of retarders having the following structural formulae



(I)

(II)

(III)

wherein R is selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cycloalkyl radicals having 5 to 7 carbon atoms, aralkyl radicals having 7 to 11 carbon atoms and aryl radicals having 6 to 10 carbon atoms, the aryl radicals being unsubstituted or substituted with 1 or 2 radicals selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms and the chloro radical; wherein R^1 is a radical described for R with the proviso that when R^1 is an alkyl group it is either primary or secondary; R^2 is selected from the group consisting of alkylene radicals conforming to the following structural formula:

$$-(C_mH_{2m})-(R^4)_X-(C_nH_{2n})-$$

wherein X is 0 or 1, wherein R^4 is selected from the group consisting of —O—, —S— and phenylene, wherein when R^4 is phenylene or X is O, *m* and *n* are positive whole numbers from 1 to 5 and when R^4 is —O— or —S—, *m* and *n* are positive whole numbers from 2 to 5, and arylene radicals having 6 to 12 carbon atoms, and R^3 is an alkylene radical conforming to the following structural formula:

$$-(C_xH_{2x})-(R^5)_Y-(C_yH_{2y})-$$

wherein Y is 0 or 1, wherein R^5 is selected from the group consisting of —O—, —S— and phenylene and wherein *x* and *y* are positive whole numbers from 2 to 4.

4,085,095

CLOTTABLE FIBRINOGEN FREE FACTOR VIII PRODUCT AND PROCESS

Rodger L. Bick, 29 Mast St., Marina Peninsula, Los Angeles, Calif. 90291, and Lajos F. Fekete, 3350 Nevada Ave., Costa Mesa, Calif. 92626, assignors to Rodger L. Bick; Lajos F. Fekete, both of Bakersfield and William L. Wilson, Santa Monica, all of, Calif.

Division of Ser. No. 651,614, Jan. 22, 1976, Pat. No. 4,027,013. This application Dec. 15, 1976, Ser. No. 750,849

Int. Cl.[2] **A23J** *1/06;* **A61K** *35/14*

U.S. Cl. 260—112 B **1 Claim**

1. Process comprising:

admixing a clottable fibrinogen lean Factor VIII concentrate containing less than approximately 0.2 milligrams of clottable fibrinogen per unit of Factor VIII with from about 0.5 to 3 units per 1000 milligrams of clottable fibrinogen of a thrombin mimetic reagent that does not significantly impair the potency of said Factor VIII, and allowing the clottable fibrinogen to form a clot in the resultant admixture; and

separating said clot from said resultant admixture and recovering a clottable fibrinogen free Factor VIII concentrate.

4,085,096

HEXAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Francis John Tinney, and Ernest D. Nicolaides, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Sep. 15, 1976, Ser. No. 723,370

Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 LH **8 Claims**

1. A compound having the name N^{α}-t-butoxycarbonyl-L-tryptophyl-N^{im}-benzyl-L-histidyl-O-benzyl-L-tyrosyl-O-benzyl-L-seryl-L-prolyl-D-alanine methyl ester.

4,085,097

PROCESS FOR THE MANUFACTURE OF CHROMIUM COMPLEXES FROM METALLIZABLE AZO OR AZO METHINE DYES

Fabio Beffa, Riehen; Arthur Bühler, Rheinfelden, both of Switzerland; Peter Donath, Grenzach, Germany; Hans Ulrich Schutz, Basel, Switzerland, and Gerhard Back, Lorrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 427,276, Dec. 20, 1973, abandoned. This application Jan. 7, 1976, Ser. No. 647,268

Claims priority, application Switzerland, Dec. 22, 1972, 18724/72; Nov. 30, 1973, 16848/73

Int. Cl.[2] **C09B** *45/06, 45/34, 45/48, 55/00*

U.S. Cl. 260—145 A **4 Claims**

1. In a process of preparing a 1:1- or 1:2-chromium complex of a chromatable o-hydroxy-o'-(hydroxy or carboxy) azomethine or o-hydroxy-o'-(hydroxy, methoxy, amino or carboxy) azo dye by reacting said dye with a chroming agent with the liberation of water and the formation of inorganic salts, the improvement comprising carrying out the chroming reaction in the presence of a water insoluble or sparingly soluble organic solvent capable of forming an azeotrope with water, having a boiling point between 80° and 180° C and selected from the group consisting of alcohols with 4 to 6 carbon atoms and aliphatic ketones of up to 8 carbon atoms, removing water from the reaction mixture by azeotropically distilling said reaction mixture, and separating precipitated inorganic salts from the azeotropically distilled reaction mixture to obtain a substantially salt-free organic solution of said complex.

4,085,098

AZO DYES CONTAINING A HETEROCYCLIC RING HAVING A QUATERNIZED NITROGEN ATOM AND AT LEAST ONE OPTIONALLY SUBSTITUTED PHENOXYALKYL OR NAPHTHYLOXYALKYL SUBSTITUENT

Beat Henzi, Neuallschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

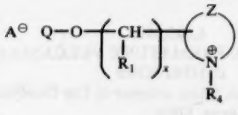
Filed Jul. 30, 1973, Ser. No. 383,877

Claims priority, application Switzerland, Jul. 31, 1972, 11354/72; Dec. 7, 1972, 17824/72; Feb. 5, 1973, 1618/73

Int. Cl.[2] **C09B** *29/08, 29/36;* **D06P** *3/24, 3/52*

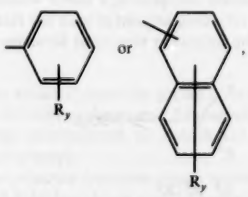
U.S. Cl. 260—157 **20 Claims**

1. A compound of the formula



or a mixture thereof, wherein

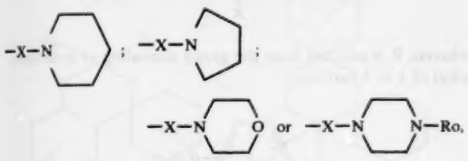
Q is



wherein

each R is independently hydroxy; halo; alkyl; alkyl substituted by halo, hydroxy, cyano, phenyl or phenoxy;

alkoxy; alkoxy substituted by halo, hydroxy, cyano, phenyl or phenoxy; trifluoromethyl; cycloalkyl of 5 or 6 carbon atoms; substituted cycloalkyl of 5 or 6 carbon atoms each substituent of which is independently alkyl; cyano; nitro; phenoxy; naphthyloxy; phenylazo; —CORo; —CO—ORo; —CO—NH—Ro; —NH—CO—Ro; —CO—N(Ro)$_2$; —O—CO—Ro; —O—CO—NH—Ro; —O—CO—N(Ro)$_2$; —SO$_2$—Ro; —SO$_2$—NH—Ro; —SO$_2$—N(Ro)$_2$; —O—SO$_2$—NH—Ro; —O—SO$_2$—N(Ro)$_2$;



wherein

each Ro is independently alkyl or phenyl, and

each X is independently —CO— or —SO$_2$—, and

y is 0, 1, 2, 3, 4 or 5,

each R_1 is independently hydrogen; alkyl; alkyl substituted by halo, alkoxy or phenoxy; phenyl or cycloalkyl of 5 or 6 carbon atoms,

is thiazolium, isothiazolium, thiadiazolium, triazolium, imidazolium, indazolium, oxazolium, pyridinium, pyrimidinium, pyridazinium, pyrazinium, benzothiazolium, oxadiazolium, quinoxalinium, cinnolinium, quinolinium, phthalazinium, pyrazolium, benzoxazolium or benzimidazolium, or a substituted derivative thereof, wherein each substituent is independently alkyl; alkyl substituted by phenyl, phenoxy, hydroxy, carbamoyl, cycloalkyl of 5 or 6 carbon atoms, cyano or halo; alkoxy; alkoxy substituted by phenyl, phenoxy, hydroxy, carbamoyl, cycloalkyl of 5 or 6 carbon atoms, cyano or halo; alkenyl of 2 to 4 carbon atoms; alkenyl of 2 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; cycloalkyl of 5 to 7 carbon atoms; substituted cycloalkyl of 5 to 7 carbon atoms each substituent of which is independently alkyl, alkoxy or halo; phenyl; substituted phenyl each substituent of which is independently cyano, nitro, alkyl, alkoxy or halo; phenoxy; substituted phenoxy each substituent of which is independently cyano, nitro, alkyl, alkoxy or halo; —CO—Ro; —CO—ORo; —CO—NH—Ro; —CO—N(Ro)$_2$; —NH—CO—Ro; —SO$_2$Ro; —SO$_2$—NH—Ro; —SO$_2$—N(Ro)$_2$; —NH—SO$_2$—Ro or phenylazo, wherein each Ro is independently alkyl or phenyl,

R_4 is alkyl of 1 to 8 carbon atoms; alkyl of 1 to 8 carbon atoms substituted by halo, hydroxy, phenyl, cycloalkyl of 5 or 6 carbon atoms, alkoxy or carbamoyl; alkenyl of 2 to 8 carbon atoms; alkenyl of 2 to 8 carbon atoms substituted by halo, hydroxy, phenyl, cycloalkyl of 5 or 6 carbon atoms, alkoxy or carbamoyl; alkoxy; alkoxy substituted by halo, hydroxy, phenyl, cycloalkyl of 5 or 6 carbon atoms, alkoxy or carbomoyl; cycloalkyl of 5 or 6 carbon atoms or substituted cycloalkyl of 5 or 6 carbon atoms each substituent of which is independently alkyl, alkoxy, halo or hydroxy,

K is a coupling component radical free of water-solubilizing groups,

x is 1, 2 or 3, and

A⊖ is an anion,

wherein

each alkyl, alkoxy, alkyl moiety of each group and alkoxy moiety of each group independently has 1 to 4 carbon atoms unless otherwise indicated, and

each halo is independently chloro, bromo or iodo.

4,085,099

WATER-INSOLUBLE NITROPHENYLAZOPHENYL COMPOUNDS CONTAINING A TERMINAL —N—(CH$_2$)$_n$—O—CO— OR —CO—O—CH$_2$—CH$_2$—C$_3$F$_5$ GROUP

Jean Marie Louis Leroy, Saint Etienne du Rouvray, and Jacques Pierre Edmond Pechmeze, Paris, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

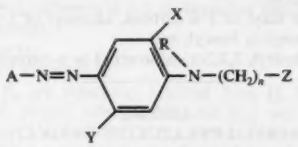
Filed Apr. 3, 1974, Ser. No. 457,681

Claims priority, application France, Apr. 13, 1973, 73.13393

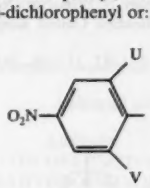
Int. Cl.[2] **C09B** *29/00, 29/08, 29/26, 31/04*

U.S. Cl. 260—207 **4 Claims**

1. A dyestuff represented by the structural formula:



in which A is 4-chlorophenyl, 4-cyanophenyl, 2,4-dicyanophenyl, 4-methylsulphonylphenyl, 4-carbomethoxyphenyl, 4-carbethoxyphenyl, 2,4-dichlorophenyl, 4-chloro-2-trifluoromethylphenyl, 2-cyano-4-chlorophenyl, 4-chloro-2-carbomethoxyphenyl, 4-cyano-2,6-dichlorophenyl or:



wherein

U and V are the same or different and each represents hydrogen, chlorine, bromine, nitro, cyano, carbalkoxy containing 2 to 5 carbon atoms or alkylsulphonyl containing 1 to 4 carbon atoms,

X is hydrogen, methyl, methoxy or ethoxy,

Y is hydrogen, chlorine, methyl, methoxy, formylamino, acetylamino, 4,4,5,5,5-pentafluoro-valerylamino, benzoylamino, phenylacetylamino or cinnamoylamino,

Z is —O—CO—CH$_2$CH$_2$C$_2$F$_5$, —CO—O—CH$_2$CH$_2$C$_2$F$_5$ or, provided that Y is —NH—CO—CH$_2$CH$_2$C$_2$F$_5$, hydrogen, hydroxy, cyano, carbalkoxy containing 2 to 5 carbon atoms, acetyloxy, propionyloxy, butyryloxy or valeryloxy,

n is 1,2, or 3, and either

R is alkyl containing 1 to 4 carbon atoms, said alkyl being unsubstituted or substituted by one hydroxy, cyano, carbalkoxy containing 2 to 5 carbon atoms, acetyloxy, propionyloxy, butyryloxy or valeryloxy,

or R is —(CH$_2$)$_n$—Z', Z' being —O—CO—CH$_2$CH$_2$C$_2$F$_5$ or —CO—O—CH$_2$CH$_2$C$_2$F$_5$.

4,085,100

INTERMEDIATE FOR DEPHTHALOYLATION OF AZETIDINONE COMPOUNDS

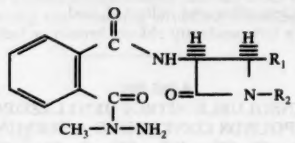
William D. Kingsbury, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed Nov. 1, 1976, Ser. No. 737,297

Int. Cl.[2] **A61K** *31/395;* **C07D** *205/06*

U.S. Cl. 260—239 A **5 Claims**

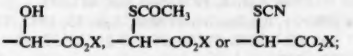
1. The compound of the formula:



in which:

R_1 is —COOY or $—CH_2OZ$;

R_2 is 2,4-dimethoxybenzyl, hydrogen, benzhydryl, trityl,



Y is lower alkyl of 1–6 carbons, benzyl, phenyl or 2,2,2-trichloroethyl;

Z is lower alkyl of 1–6 carbons, alkanoyl of 2–6 carbons, mesyl, tosyl or benzyl; and

X is benzhydryl, 2,2,2-trichloroethyl or p-nitrophenyl.

4,085,101

1,3-DIARYL-2-PYRAZOLINE DERIVATIVES

Alec Victor Mercer, Leeds; Peter Stuart Littlewood, Ilkley; Ivan Joseph Bolton, Bingley, all of England, and Fritz Fleck, Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

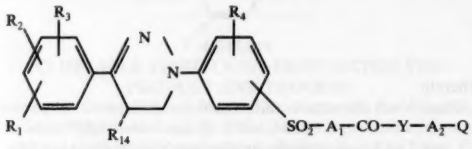
Continuation of Ser. No. 487,844, Jul. 11, 1974, abandoned. This application May 5, 1976, Ser. No. 683,409

Claims priority, application United Kingdom, Jul. 18, 1973, 34111/73

Int. Cl.[2] **C07D** *231/42, 231/06, 235/00, 233/00*

U.S. Cl. 260—239.9 **13 Claims**

1. A compound of the formula i,



wherein R_1, R_2, R_3 and R_4, independently, are hydrogen, chloro, fluoro, C_{1-4}alkyl or C_{1-4}alkoxy,

R_{14} is C_{1-4}alkyl,

A_1 is unsubstituted C_{1-3}alkylene,

A_2 is unsubstituted C_{1-3}alkylene or phenylene,

Y is —O— or

in which R_6 is hydrogen or C_{1-2}alkyl, and

Q is $—NR_{18}R_{19}$, where R_{18} and R_{19}, independently, are C_{1-4}alkyl, or the quaternary ammonium or acid addition salts thereof.

4,085,102

2-AMINO-8-ARYLIDENO-3,4,5,6,7,8-HEXAHYDRO-4-ARLYPYRIDO[4,3-d]PYRIMIDINES

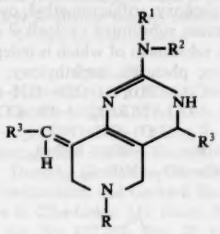
John Krapcho, Somerset, and Chester Frank Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 526,754, Nov. 25, 1974, abandoned. This application Jul. 22, 1977, Ser. No. 817,954

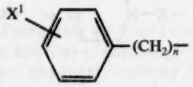
Int. Cl.[2] **C07D** *471/04;* **A61K** *31/505*

U.S. Cl. 542—450 **7 Claims**

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbons,



wherein *n* is 1, 2, or 3, and alkanoyl of 2 to 5 carbons; R^1 and R^2 are independently selected from the group consisting of hydrogen and straight or branched chain alkyl of 1 to 4 carbons provided that wherein R^1 and R^2 are both alkyl, the alkyl chains are straight of 1 to 4 carbons; R^3 is selected from the group consisting of

pyridyl, and thienyl; and X and X^1 are independently selected from the group consisting of hydrogen, halogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, and trifluoromethyl; and the pharmaceutically acceptable acid addition salts thereof.

4,085,103

6-SUBSTITUTED-4-HYDROXYCINNOLIN-3-yl-CARBOXYLIC ACIDS AND ESTERS THEREOF

John Preston, and Austin John Reeve, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 626,531, Oct. 28, 1975, Pat. No. 4,045,439. This application May 5, 1977, Ser. No. 794,114

Claims priority, application United Kingdom, Nov. 7, 1974, 48205/74

Int. Cl.[2] **C07D** *237/28*

U.S. Cl. 260—250 C **2 Claims**

1. 6-Dimethylamino-4-hydroxycinnolin-3-yl carboxylic acid or a pharmaceutically-acceptable salt thereof.

2. Ethyl 6-n-but-2-ylamino-4-hydroxycinnolin-3-yl carboxylate or a pharmaceutically-acceptable acid-addition salt thereof.

4,085,104

XANTHATES OF 2,3,4,5-TETRAHYDROPYRIMIDINE

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Sep. 27, 1972, Ser. No. 292,494

Int. Cl.[2] **C07D** *239/06, 239/74*

U.S. Cl. 260—251 R **2 Claims**

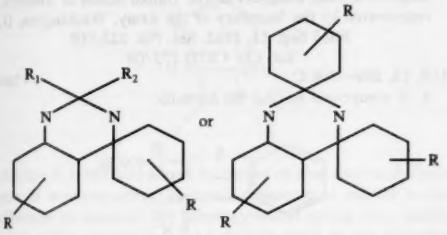
1. A Xanthate formed by the reaction of (1) a 2,3,4,5-tetrahydropyrimidine prepared by reacting a carbonyl compound from the group consisting of aldehydes and ketones with ammonia in the presence of carbon disulfide as a catalyst with (2) carbon disulfide.

4,085,105
HEXAHYDROPYRIMIDINES

Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 15, 1973, Ser. No. 406,544
Int. Cl.[2] C07D *239/74*
U.S. Cl. 260—251 A 7 Claims

1. Hexahydropyrimidine having the formula



where each R is hydrogen, alkyl, aryl, cycloalkyl, alkaryl or aralkyl.

4,085,106
BICYCLIC AND TRICYCLIC TRISAMINOMETHANES

Thomas Joseph Atkins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 7, 1976, Ser. No. 647,643
Int. Cl.[2] C07D *487/14*
U.S. Cl. 260—256.4 F 4 Claims

1. Tricyclic trisaminomethanes of the formula

in which

R^1 and R^2, alike or different, are alkylene of 2 to 6 carbons with at least 2 carbons in the backbone, and

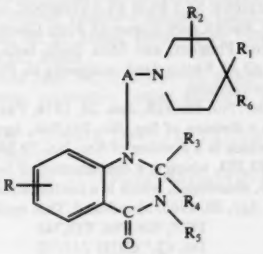
R^8 is alkylene of 3 to 6 carbons with 3 carbons in the backbone.

4,085,107
1-HETEROCYCLIC ALKYL-1,2,3,4-TETRAHYDROQUINAZOLINONES

Bola Vithal Shetty, Rockville, Md., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 452,587, Mar. 19, 1974, abandoned, which is a continuation of Ser. No. 108,659, Jan. 21, 1971, abandoned, which is a division of Ser. No. 691,955, Dec. 20, 1967, Pat. No. 3,635,976. This application Aug. 23, 1976, Ser. No. 716,856
Int. Cl.[2] C07D *239/88*
U.S. Cl. 260—256.4 Q 5 Claims

1. A member of the group consisting of (a) a compound of the formula:



wherein

R is H, lower alkyl, hydroxy, lower alkoxy, halogen, amino, nitro, —NHCHO or —$NHCOCH_3$;

A is $(CH_2)_n$, where n is 1–5, or branched chain alkylene of 3–5 carbons;

R_1 is phenyl;

R_2 is H or lower alkyl;

R_3 and R_4 are separately selected from H, lower alkyl, phenyl, phenyl substituted in the ring with OH, NH_2, OCH_3, Cl or —$NHCOCH_3$, phenyl lower alkyl-, and phenyl lower alkyl- substituted in the ring with OH, NH_2, OCH_3 or Cl; or R_3 and R_4 join together with the 2-position carbon atom to which they are attached to form a methylene ring having 3–10 carbons;

R_5 is H, lower alkyl, phenyl, phenyl lower alkyl-, or phenyl substituted in the ring with OH, NH_2, OCH_3, Cl or —$NHCOCH_3$;

R_6 is propionazy;

and (b) a pharmacologically acceptable acid addition salt thereof.

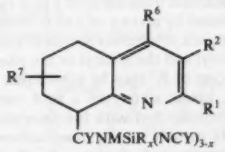
4,085,108
SILICON DERIVATIVES OF TETRAHYDROQUINOLINES

Adrian Charles Ward Curran, North Humberside, and Robin Gerald Shepherd, Maidenhead, both of England, assignors to John Wyeth & Brother Ltd., Taplow, England

Continuation-in-part of Ser. No. 526,565, Nov. 25, 1974, Pat. No. 4,000,142. This application Sep. 8, 1976, Ser. No. 721,263
Claims priority, application United Kingdom, Dec. 17, 1973, 58307/73; Feb. 4, 1974, 4956/74; Mar. 27, 1974, 13514/74; Jul. 12, 1974, 30934/74
Int. Cl.[2] C07D *215/12*
U.S. Cl. 260—283 SC 3 Claims

1. A compound of formula III

(III)



wherein R^1, R^2 and R^6 are independently hydrogen, trifluoromethyl, alkyl of 1 to 6 carbon atoms, phenyl alkyl of 7 to 12 carbon atoms or phenyl, or R^1 and R^2 taken together represent an R^7 substituted alkylene chain, said alkylene chain consisting of 3 to 5 carbon atoms, inclusive; R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, gem-di-n-alkyl in which each alkyl group has 1 to 6 carbon atoms, phenyl alkyl of 7 to 12 carbon atoms or phenyl; with the proviso that when R^1 and R^2 or R^2 and R^6 are both alkyl, they are normal or secondary alkyl; Y is oxygen or sulphur, M is sodium, potassium, lithium, MgCl, MgBr or MgI; each group R is independently alkyl of 1 to 6 carbon atoms, phenyl or phenyl alkyl of 7 to 12 carbon atoms, x is an integer from 0 to 3 inclusive.

4,085,109
PYRIDINE SULFUR FLAVORING AGENTS

Max Winter, Petit-Lancy (Geneva); Fritz Gautschi, Commugny (Vaud); Ivon Flament, and Max Stoll, both of Petit-Lancy (Geneva), all of Switzerland, assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,819, Jun. 24, 1974, Pat. No. 4,038,435, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965, abandoned. This application Sep. 22, 1975, Ser. No. 615,748

Int. Cl.² C07D *213/32*

U.S. Cl. 260—294.8 E **3 Claims**

1. Pyridine sulfur compounds selected from the group consisting of (pyridyl-2)-thiol acetate and 2-(pyridyl-2)-ethyl furfuryl sulfide.

4,085,110
1,2,3,5,6,7-HEXAHYDRODICYCLOPENTA[b,e]PYRIDINE DERIVATIVES

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother, Ltd., Taplow, England

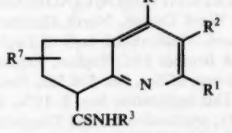
Division of Ser. No. 624,080, Oct. 20, 1975, Pat. No. 4,031,102, which is a continuation-in-part of Ser. No. 600,257, Jul. 30, 1975, which is a continuation-in-part of Ser. No. 460,265, Apr. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,837

Claims priority, application United Kingdom, Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; Jul. 21, 1973, 34866/73; Aug. 16, 1973, 38701/73; Oct. 17, 1973, 48595/73

Int. Cl.² C07D *221/06*

U.S. Cl. 260—294.8 B **3 Claims**

1. A compound of formula I



or an acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^6 is selected from hydrogen and alkyl containing from 1 to 6 carbon atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, R^1 and R^2 taken together represent a polymethylene chain of 3 carbon atoms, R^7 represents hydrogen or 1 or 2 groups selected from alkyl of 1 to 6 carbon atoms (which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl), phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms or phenyl and the phenyl or the phenyl portion of the phenylalkyl group of R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisio that when two akyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

4,085,111
1H-TETRAZOLE DERIVATIVES

Takanori Oe, Nakatsu, and Mineo Tsuruda, Shiidamachi, both of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed May 20, 1975, Ser. No. 579,173

Claims priority, application Japan, May 28, 1974, 49-60632

Int. Cl.² C07D *401/14*; A61K *31/535, 31/495, 31/435*

U.S. Cl. 260—296 H **2 Claims**

1. The compound 7-(5-1H-tetrazolyl-5-oxo-5H[1]benzopyrano[2,3-*b*]pyridine and the pharmaceutically acceptable salt thereof.

4,085,112
2-FORMYL-3-ALKYL-BENZOTHIAZOLIUM HALIDE OXIME

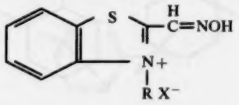
Robert H. Poirier, Columbus, Ohio, and Edward J. Poziomek, Edgewood, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 11, 1962, Ser. No. 223,310

Int. Cl.² C07D *275/04*

U.S. Cl. 260—304 C **4 Claims**

1. A compound having the formula:



where R is an alkyl group of 1–4 carbons and X is selected from the group consisting of chlorine, bromine, and iodine.

4,085,113
PROCESS FOR THE PREPARATION OF AZETIDINONE-THIAZOLINE PRECURSORS FOR CEPHALOSPORIN SYNTHESIS

Maurizio Foglio; Ugo Scarponi, both of Milan, and Federico Arcamone, Nerviano (Milan), all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

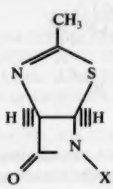
Filed Jul. 23, 1975, Ser. No. 598,260

Claims priority, application United Kingdom, Oct. 3, 1974, 42859/74

Int. Cl.² C07D *513/04*

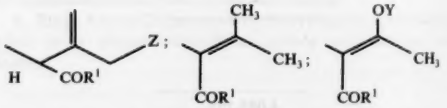
U.S. Cl. 260—306.7 C **1 Claim**

1. A process for the preparation of azetidinonethiazoline precursors for cephalosporin synthesis of the formula:

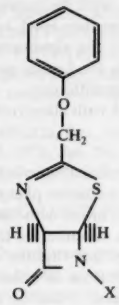


(II)

wherein X is a member selected from the group consisting of a hydrogen atom and of a group of the structure:



in which R^1 is a member selected from the group consisting of a hydroxy group, an alkoxy group having from 1 to 4 carbon atoms, a trichloroethoxy, a benzyloxy, p-methoxybenxyloxy, p-nitrobenzyloxy, benzhydryloxy, triphenylmethoxy, phenacyloxy, p-halophenacyloxy, phtalimidomethoxy, acyloxymethyloxy, acylamidomethyloxy; Z is a member selected from the group consisting of hydrogen, an -O-alkyl, or -O-CO-alkyl group in which the alkyl component contains from 1 to 4 carbon atoms, and Y is a member selected from the group consisting of a hydrogen atom and an alkyl group having from 1 to 4 carbon atoms, which comprises the steps of reducing a compound of formula:



wherein X is defined above by means of zinc dust in the presence of aqueous acetic acid at a temperature and for a time sufficient to convert the phenoxymethyl group to a methyl group while retaining the 2,3 double bond of the thiazoline ring, recovering the product so obtained and purifying it.

4,085,114

1,2-BENZOISOXAZOLE DERIVATIVES AND THE PRODUCTION THEREOF

Ikuo Adachi; Motohiko Ueda, both of Suita, and Sadatoshi Kimoto, Kusatsu, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

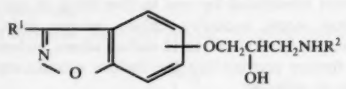
Filed Aug. 9, 1976, Ser. No. 713,044

Claims priority, application United Kingdom, Sep. 9, 1975, 37132/75

Int. Cl.[2] C07D *261/20*

U.S. Cl. 260—307 DA **7 Claims**

1. A compound of the formula:



wherein

R^1 is methyl;

R^2 is isopropyl, tert-butyl, 3,4-dimethoxyphenethyl, or phenoxyethyl;

and the pharmaceutically acceptable acid-addition salts thereof.

4,085,115

CARBOXAMIDO TETRAZOLES

Joachim Augstein; Hugh Cairns, and Norman Harold Rogers, all of Loughborough, England, assignors to Fisons Limited, England

Continuation of Ser. No. 421,282, Dec. 3, 1973, abandoned. This application Apr. 6, 1976, Ser. No. 674,732

Claims priority, application United Kingdom, Dec. 5, 1972, 55997/72; Aug. 13, 1973, 39046/73

Int. Cl.[2] C07D *257/04;* **A61K** *31/41;* **C07D** *493/04*

U.S. Cl. 260—308 D **3 Claims**

1. The compound 4,10-dioxo-5-methoxy-4H,10H-benzo(1,2-b:3,4-b')dipyran-2,8-di[N-(tetrazol-5-yl)]carboxamide and pharmaceutically acceptable salts thereof.

4,085,116

NOVEL CHROMONE DERIVATIVES

Akira Nohara, Kyoto; Toshihiro Ishiguro, Osaka, and Yasushi Sanno, Ikeda, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Mar. 24, 1976, Ser. No. 669,973

Claims priority, application United Kingdom, Apr. 11, 1975, 15061/75

Int. Cl.[2] A61K *31/41;* **C07D** *257/04*

U.S. Cl. 260—308 D **5 Claims**

1. The compound 6-(1-hydroxyethyl)-3-(1H-tetrazol-5-yl)-chromone.

4,085,117

6,7-DISUBSTITUTED-5-(ACYL)BENZOFURAN-2-CARBOXYLIC ACIDS

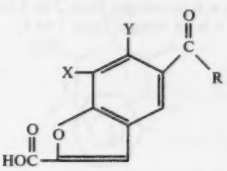
Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., Chalfont, and William F. Hoffman, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 18, 1976, Ser. No. 733,840

Int. Cl.[2] C07D *333/24;* **A01N** *9/00*

U.S. Cl. 260—332.2 A **9 Claims**

1. A compound having the formula:



wherein

X is halo, methyl or hydrogen;

Y is halo or methyl and

R is thienyl or a substituted thienyl wherein the substituent is halo or methyl, and

the non-toxic pharmaceutically acceptable salt derivative thereof.

4,085,118

5-(5-HALOGENATEDPHENYL-2-FURANYL)DIHYDRO-2(3H)-FURANONES

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

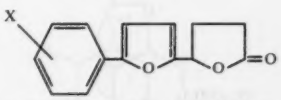
Filed Dec. 17, 1976, Ser. No. 751,279

The portion of the term of this patent subsequent to Jun. 21, 1994, has been disclaimed.

Int. Cl.[2] C07D *307/58*

U.S. Cl. 260—343.6 **6 Claims**

1. A compound of the formula:



wherein X represents 4-bromo, 3,4-dichloro; 4-fluoro; 2-chloro, or 3-chloro.

4,085,119

4-SUBSTITUTED AMINO DERIVATIVES OF OLEANDOMYCIN

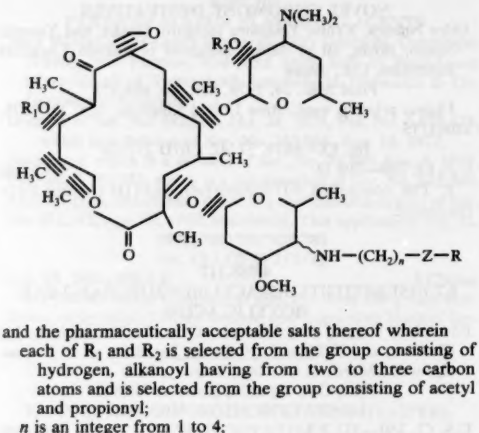
Robert F. Myers, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,488

Int. Cl.[2] A61K *31/35;* **C07D** *407/14*

U.S. Cl. 260—343 **7 Claims**

1. An epimeric compound having the formula



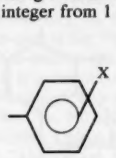
and the pharmaceutically acceptable salts thereof wherein

each of R_1 and R_2 is selected from the group consisting of hydrogen, alkanoyl having from two to three carbon atoms and is selected from the group consisting of acetyl and propionyl;

n is an integer from 1 to 4;

Z is selected from the group consisting of O, S, SO, SO_2, >CO, CHOH and NH; provided that when Z is O, S, SO, SO_2 or NH, n is an integer from 2 to 4 and when Z is CO or CHOH, n is an integer from 1 to 4;

and R is



wherein X is selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl having from one to four carbon atoms, alkoxy having from one to four carbon atoms, trifluoromethyl, $N(CH_3)_2$, cyano, thioalkyl having from one to four carbon atoms and sulfonylalkyl having from one to four carbon atoms.

4,085,120

3(1'-HYDROXY-2'-HYDROXYETHYL)-4-HYDROXY-6-SILYLOXYHEXANOIC ACID 4αLACTONE DERIVATIVES

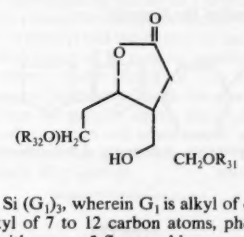
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,088

Int. Cl.[2] C07D *307/32*

U.S. Cl. 260—343.6 **2 Claims**

1. A thromboxane intermediate of the formula



wherein R_{32} is Si $(G_1)_3$, wherein G_1 is alkyl of one to 4 carbon atoms, aralkyl of 7 to 12 carbon atoms, phenyl, or phenyl substituted with one or 2 fluoro, chloro or alkyl of one to 4 carbon atoms, with the proviso that the various G_1's are the same or different;

wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};

wherein R_9 is an acyl protecting group selected from the group consisting of

a. benzoyl;

b. benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different.

c. benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;

d. naphthoyl;

e. naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and

f. alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of

a. tetrahydropyranyl;

b. tetrahydrofuranyl; and

c. a group of the formula $—C(OR_{11})(R_{12})—CH(R_{13})(R_{14})$,

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $—(CH_2)_a—$ or $—(CH_2)_b—O—(CH_2)_c$ wherein a is 3, 4, or 5, or b is one, 2, or 3, and c is one, 2, or 3, with the proviso that b plus c is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl; wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

a. benzyl,

b. benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,

c. benzhydryl,

d. benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

e. trityl, and

f. trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,085,121

PREPARATION OF MALEIC ANHYDRIDE FROM FOUR-CARBON HYDROCARBONS USING TI, P, O, CONTAINING CATALYST

Ernest C. Milberger, Solon; Noel J. Bremer, Kent, and Eunice K. T. Wong, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 4, 1977, Ser. No. 784,190

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **9 Claims**

1. In the process for the production of maleic anhydride by the oxidation of n-butane, n-butenes, 1,3-butadiene or mixture thereof with molecular oxygen in the vapor phase at a reaction temperature of 250° C to 600° C in the presence of a catalyst, the improvement comprising using a vanadium-free catalyst consisting essentially of the oxides of titanium and phosphorus.

4,085,122

PRODUCTION OF MALEIC ANHYDRIDE USING A MIXED-OXIDE OXIDATION CATALYST CONTAINING VANADIUM AND PENTAVALENT PHOSPHORUS

Giancarlo Stefani, Bergamo, Italy, and Pietro Fontana, Schaffhausen, Switzerland, assignors to Lonza, Ltd., Basel, Switzerland

Division of Ser. No. 648,025, Jan. 12, 1976. This application Aug. 3, 1976, Ser. No. 711,213

Claims priority, application Switzerland, Jan. 10, 1975, 266/75

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **14 Claims**

1. The process which comprises producing maleic anhydride from C_4-hydrocarbons in the gaseous phase, using a mixed-oxide oxidation catalyst obtained by the process set out hereinafter as an oxidation catalyst, said mixed-oxide oxidation catalyst having, based on the vanadium and pentavalent phosphorus, an atomic ratio of phosphorus to vanadium between 1.05 to 1 and 1.10 to 1, and said mixed-oxide oxidation catalyst having been produced by the process which includes (a) reacting a salt of tetravalent vanadium, dissolved in a non-oxidizing acid aqueous solution, with orthophosphoric acid, a soluble vanadium salt complex forming, (b) isolating complex (b), (c) drying complex (b), (d) putting or forming dried complex (b) into the desired form and (e) subjecting the formed, dried complex to a heat treatment of at least 300° C, said mixed oxide catalyst resulting, the improvement in said catalyst production process which comprises the steps of concentrating aqueous reaction mixture (a) and isolating complex (b) by precipitating said complex by adding water to said concentrated aqueous reaction mixture (a).

4,085,123

1,3-DIAZIDO-2-NITRAZAPROPANE

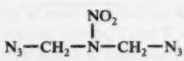
Joseph E. Flanagan, Woodland Hills, and Milton B. Frankel, Tarzana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 21, 1976, Ser. No. 734,495

Int. Cl.[2] C07C *117/00*

U.S. Cl. 260—349 **2 Claims**

1. An energetic plasticizer having the composition



4,085,124

OXIDATIVE COUPLING OF ALKYLPHENOLS, ALKOXYPHENOLS AND 1-NAPHTHOLS CATALYZED BY METAL COMPLEXES OF AMINO COMPOUNDS

Thomas F. Rutledge, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

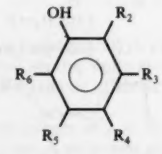
Filed Nov. 24, 1975, Ser. No. 634,644

Int. Cl.[2] C07C *37/00, 45/16, 49/62, 49/72*

U.S. Cl. 260—396 N **17 Claims**

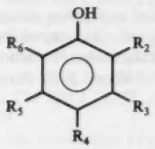
1. A method of preparing a carbon-carbon coupled condensation product of an "alkylphenol", an "alkoxyphenol" or a "1-naphthol" having one of the following formulas I-V:

I.



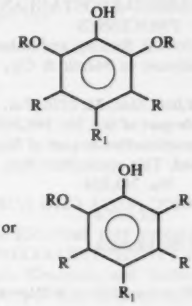
wherein R_2 and R_6 are alkyl groups, R_3 and R_5 are hydrogen or alkyl groups and R_4 is hydrogen or methyl, provided that R_3 and R_5 are not simultaneously tertiary alkyl, said alkyl groups having 1–12 carbon atoms,

II.



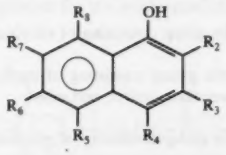
wherein R_2 and R_4 are alkyl groups, R_3 and R_5 are hydrogen or alkyl groups and R_6 is hydrogen, provided that at least one of R_2 and R_4 is a tertiary alkyl group, said alkyl groups having 1–12 carbon atoms,

III.



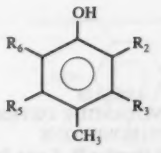
wherein each R is an alkyl group having 1–12 carbon atoms or alkoxy group having 1–6 carbon atoms and R_1 is hydrogen or methyl, provided that both substituents adjacent to R_1 are not simultaneously tertiary alkyl or tertiary alkoxy,

IV.



wherein R_2, R_3 and R_4 are hydrogen, alkyl groups containing from 1 to 5 carbon atoms or alkoxy groups containing 1–6 carbon atoms provided that at least one of R_2 and R_4 is hydrogen and R_5, R_6, R_7 and R_8 are hydrogen, alkyl groups having 1–5 carbon atoms or alkoxy groups having 1–6 carbon atoms, provided that tertiary alkyl or tertiary alkoxy groups are not attached to adjacent carbon atoms of the naphthalene molecule, or

V.



wherein R_3 is hydrogen, an alkyl group having 1–12 carbon atoms or an alkoxy group having 1–6 carbon atoms, R_5 is a primary or secondary alkyl group having 1–5 carbon atoms and R_2 and R_6 are alkyl groups having 1–12 carbon atoms or alkoxy groups having 1–6 carbon atoms, by an oxidative coupling reaction said method comprising contacting an aqueous mixture of the phenol or naphthol with oxygen or oxygen containing gas in the presence of a catalyst system consisting essentially of a cupric, manganous, cobaltous, or ferric metal complex of an amine selected from the class consisting of:

an "aliphatic hydroxy amine",
a heterocyclic hydroxy amine, and
an "aliphatic diamine"
and a sufficient amount of an alkaline material selected from the group consisting of alkali metal hydroxides, alkali metal carbonates and alkali metal bicarbonates to maintain the pH in a range of about 5–10 during the oxidative coupling reaction.

4,085,125

9-THIA-, 9-OXOTHIA-, AND 9-DIOXOTHIA-11,12-SECO-PROSTAGLANDINS AND PROCESSES

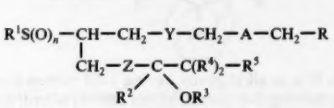
Edward J. Cragoe, Jr.; John B. Bicking, and Robert L. Smith, all of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 669,006, Mar. 22, 1976, Pat. No. 4,018,802, which is a continuation-in-part of Ser. No. 566,566, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 483,178, Jun. 25, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 743,824

Int. Cl.[2] C07C *147/14;* C11D *1/28*

U.S. Cl. 260—402 **15 Claims**

1. The compound of the formula



wherein
R is carboxy, a carboxy salt, or a carboxy ester;
A is methylene;
Y is selected from the group consisting of ethylene, vinylene, and ethynylene;
R^1 is selected from the group consisting of methyl, ethyl, 2-hydroxyethyl, 2-(loweralkoxy)ethyl, and vinyl;
n is 0, 1, or 2;
Z is selected from the group consisting of ethylene, vinylene, and ethynylene;
R^2 is hydrogen or methyl;
R^3 is hydrogen;
R^4 is hydrogen or methyl;
R^5 is OR^{5a} wherein R^{5a} is phenyl in which the phenyl ring can be substituted with one or two substituents selected from the group consisting of halogen, methyl, methoxy, or trifluoromethyl.

4,085,126

FATTY ALKANOLAMIDE DETERGENT COMPOSITIONS

Robert B. McConnell, and Douglas W. Keuer, both of Janesville, Wis., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 17, 1976, Ser. No. 724,033

Int. Cl.[2] C09F *5/00*

U.S. Cl. 260—404 **6 Claims**

1. A fatty alkanolamide composition prepared by reacting substantially equimolar amounts of a C_{12}–C_{16} saturated fatty acid and an alkylene oxide selected from the group consisting of ethylene oxide and 1,2-propylene oxide and thereupon transesterifying a mole of the resultant alkylene glycol ester with about a mole of diethanolamine or monoethanolamine.

4,085,127

METHOD FOR PRODUCING ALDEHYDE ACIDS BY SELECTIVE OZONIZATION OF CYCLO-OLEFINS

Francesco Siclari, Barlassina, and Pietro Paolo Rossi, Garlasco, both of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Application Viscosa S.p.A., Milan, Italy

Filed Jul. 10, 1974, Ser. No. 486,992

Claims priority, application Italy, Jul. 11, 1973, 26479A/73

Int. Cl.[2] C11C *1/00*

U.S. Cl. 260—413 **22 Claims**

1. A method for the production of aldehyde acids and their unsaturated derivatives from cycloolefins, comprising
subjecting a solution containing a cyclo-olefin in a concentration of from about 10 to 40% by weight, and having more than one unsaturation, to a selective ozonization step in the presence of a solvent mixture of at least one non-polar solvent and at least one polar solvent, whereby the mono-ozonide of the said cyclo-olefin is obtained, and
subjecting said mono-ozonide to at least one transposition step, to obtain an omegaformyl-alkenoic acid,
said mono-ozonide, as soon as it forms, reacting with said polar solvent to produce a heavy phase which is insoluble in said solution, and which separates therefrom during said ozonization step, whereby not more than one olefinic unsaturation is removed by said ozonization step, and
said solvent mixture further including an organic acid anhydride, with the weight ratio of said anhydride to the polar solvent being set at between 1:2 and 2:1.

20. A method according to claim 1, characterized in that the said cyclo-olefin consists of an unsaturated cyclo-olefin selected from the group consisting of 1,5,9-cyclodecatriene (in all of its forms or a mixture of the stereoisomeric forms) of 1,5-cyclo-octadiene and 1,5-cyclodecadiene, and the omega-formyl-alkenoic acid is selected from the group consisting of 11-formyl-4,8-undecadienoic acid, 7-formyl-4-heptenoic acid and 9-formyl-4-nonenoic acid and 9-formyl-6-nonenoic acid.

4,085,128

CYCLIC PHOSPHAMIDE DERIVATIVES

Akira Takamizawa, and Tsuyoshi Iwata, both of Ibaraki, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

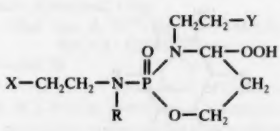
Continuation-in-part of Ser. No. 629,128, Nov. 5, 1975, abandoned. This application Nov. 2, 1976, Ser. No. 737,983

Claims priority, application Japan, Nov. 20, 1974, 49-133257

Int. Cl.[2] C07C *143/68;* A61K *31/255*

U.S. Cl. 260—456 A **2 Claims**

1. A compound of the general formula:



wherein X represents a halogen atom, Y represents a lower alkanesulfonyloxy of 1–5 carbon atoms, and R represents a lower alkyl of 1–5 carbon atoms.

4,085,129
PROCESS FOR THE PREPARATION OF CHLOROFORMIC ACID ARYL ESTERS AND CYCLIC CARBONATES

Günther Semler, Kelkheim, Taunus, and Georg Schaeffer, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 543,340, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 265,557, Jun. 23, 1972, abandoned. This application Sep. 28, 1976, Ser. No. 727,332

Claims priority, application Germany, Jun. 25, 1971, 2131555; Mar. 20, 1972, 2213408

Int. Cl.[2] C07C *68/02*

U.S. Cl. 260—463 11 Claims

1. A process for preparation of chloroformic acid aryl esters in high yields comprising the steps of: forming a liquid phase reaction mixture in a reaction zone, said reaction mixture comprising a phenol or naphthol and from 0.5 to about 20 mol percent of said phenol or naphthol of an N,N-dialkyl acid amide; introducing phosgene into said liquid phase reaction mixture in said reaction zone and reacting said phosgene and said phenol or naphthol at a temperature of 30° to 180° C and at a pressure of from atmospheric pressure to six atmospheres; continuously venting gases from said reaction zone during the course of said reaction, said vented gases including unreacted phosgene and by-product hydrogen chloride, and thereby maintaining a molar ratio of phosgene to phenol or naphthol, in said liquid phase reaction mixture, in the range of from 0.01 to 0.95, until 80% of said phenol or naphthol has been converted; and thereafter removing the liquid phase reaction mixture from the said reaction zone and recovering the chloroformic acid aryl esters therein.

4,085,130
AMMONIALYTIC CLEAVAGE OF LACTAMS TO ω-AMINONITRILES

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

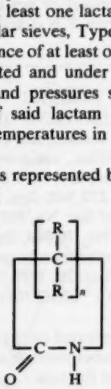
Continuation-in-part of Ser. No. 856,807, Sep. 10, 1969, abandoned. This application Jan. 9, 1974, Ser. No. 431,857

Int. Cl.[2] C07C *120/08*

U.S. Cl. 260—465.2 16 Claims

1. A method for the production of ω-aminonitriles which comprises contacting at least one lactam with a catalyst comprising Type A molecular sieves, Type X molecular sieves, or mordenites, in the presence of at least one mole of ammonia per mole of lactam converted and under reaction conditions including temperatures and pressures sufficient to effect ammonialytic cleavage of said lactam to said ω-aminonitrile, wherein said reaction temperatures in the range of about 250° to 750° C.,

wherein said lactam is represented by



wherein R is hydrogen, alkyl, cycloalkyl, aryl, or combination thereof, having up to about 8 carbon atoms per R group and a maximum of about 10 carbon atoms in all R groups,

wherein *n* is an integer of 3 to 19 when said catalyst comprises said Type A molecular sieve or said mordenite,

and wherein *n* is an integer of 3 to 9 when said catalyst comprises said Type X molecular sieves.

4,085,131
SURFACE TREATMENT

Martin B. Pearlman, 78-05 141st Street, New York, N.Y. 11367

Division of Ser. No. 428,701, Dec. 27, 1973, Pat. No. 3,968,313, and a continuation-in-part of Ser. No. 141,929, May 10, 1971, Pat. No. 3,796,608, which is a continuation-in-part of Ser. No. 630,187, Apr. 12, 1967, Pat. No. 3,578,508. This application Jul. 1, 1976, Ser. No. 701,628

Int. Cl.[2] B01J *23/72, 23/74, 23/86*

U.S. Cl. 252—470 9 Claims

1. Process for the production of products carrying surface deposits of catalytic heavy metal oxides which comprises leaching fine granular or powdered heavy metal oxide ore with aqueous medium to form an aqueous dispersion, applying said dispersion to a solid inorganic support and drying and heating to form said catalytic surface deposit on said support, said ore comprising chromite ore, magnetite, molybdenite, yellow ochre or copper ore.

4,085,132
PROCESS FOR THE PRODUCTION OF HYDROXYALKYLPHENYL DERIVATIVES

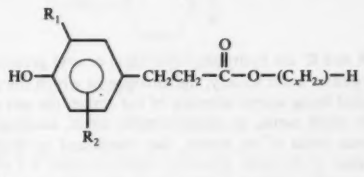
Kyong P. Park, Cranston, and Anthony F. Vellturo, North Kingstown, both of R.I., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 505,303, Sep. 12, 1975, abandoned, which is a continuation of Ser. No. 318,810, Dec. 27, 1972, abandoned. This application Jun. 24, 1975, Ser. No. 589,984

Int. Cl.[2] C07C *69/54, 69/76*

U.S. Cl. 560—75 4 Claims

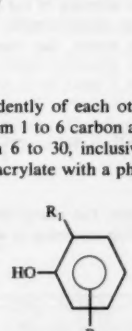
1. In the process for the production of a compound having the formula



wherein

R_1 and R_2 independently of each other represent an alkyl group having from 1 to 6 carbon atoms and

x has a value from 6 to 30, inclusively, which comprises reacting methyl acrylate with a phenol of the formula



and thereafter with a monohydric alcohol of the formula

$$HO-(C_xH_{2x})-H \qquad \text{Ia,}$$

in the presence of an alkaline catalyst, the improvement which consists essentially of

a. gradually adding methyl acrylate to the reaction mixture which comprises said phenol, monohydric alcohol and a catalyst, without isolating the intermediate.

4,085,133
PREPARATION OF MONOPEROXYPHTHALIC ACID

Robert G. Briody, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,561
Int. Cl.[2] C07C *179/10*
U.S. Cl. 260—502 R 4 Claims

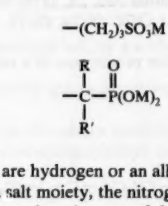
1. A process for preparing thermally stable, solid monoperoxyphthalic acid comprising reacting, in a liquid halogenated hydrocarbon reaction medium, phthalic anhydride with an aqueous hydrogen peroxide solution having a hydrogen peroxide content of at least 65 percent by weight at a molar ratio of hydrogen peroxide to phthalic anhydride of at least 1.2 to 1, said liquid halogenated hydrocarbon being a solvent for the phthalic anhydride and a non-solvent for the monoperoxyphthalic acid, precipitating monoperoxyphthalic acid and recovering a solid monoperoxyphthalic acid having a decomposition rate of less than 3.0 weight percent per day at 60° C., said reaction being conducted with agitation at a temperature of between 35° C. and 70° C., in the absence of a basic catalyst and in the absence of the addition of acids or bases after completion of the reaction.

4,085,134
AMINO-PHOSPHONIC-SULFONIC ACIDS

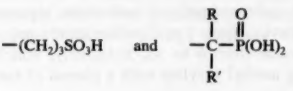
Derek Redmore, Ballwin, and Frederick T. Welge, Affton, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 15, 1974, Ser. No. 442,778
Int. Cl.[2] C07F *9/38*
U.S. Cl. 260—502.5 10 Claims

1. A compound which is an amine containing the following nitrogen-bonded groups:



where R and R′ are hydrogen or an alkyl or aryl group and M is hydrogen or a salt moiety, the nitrogen to which the groups are bonded being amino nitrogen of the amine, the salt moiety being an alkali metal, an alkaline earth metal, ammonium or ammonium form of an amine, the compound in acid form having the



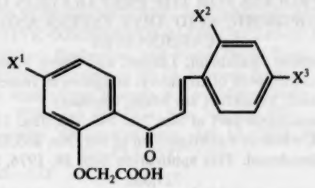
as the sole acidic groups, the compound with hydrogen in place of said groups being an amine in which said nitrogen is amino nitrogen.

4,085,135
2-(CARBOXYMETHOXY)-CHALCONES

Kazuaki Kyogoku, Tokyo; Katsuo Hatayama, Omiya; Sadakazu Yokomori, Ageo; Jiro Sawada, and Ichiro Tanaka, both of Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1977, Ser. No. 767,974
Claims priority, application Japan, Feb. 13, 1976, 51-14578
Int. Cl.[2] C07C *65/22*
U.S. Cl. 260—520 C 7 Claims

1. A compound of the formula



wherein one or two of X^1, X^2 and X^3 are 3-methyl-2-butenyloxy, and the other or others of X^1, X^2 and X^3 are hydrogen.

4,085,136
OPTICALLY-ACTIVE 1-ARYLOXY-2-PROPANOL INTERMEDIATES OF (S)-ABSOLUTE CONFIGURATION

Howard Tucker, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 520,845, Nov. 4, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,323
Claims priority, application United Kingdom, Nov. 9, 1973, 52077/73
Int. Cl.[2] C07C *103/26*
U.S. Cl. 260—559 D 6 Claims

1. An optically-active compound having the (S)-absolute configuration and having the formula:-

$$R^1OCH_2.CHOH.CH_2OY$$

wherein R^1 is phenyl which bears a substituent selected from the group consisting of:

$$R^2R^3N\text{-}CO\text{-}A\text{-}$$

and

$$R^2R^3N\text{-}CO\text{-}A^1\text{-}O\text{-}$$

wherein A is a direct link, or alkylene of 1 to 6 carbon atoms, or alkenylene of 2 to 6 carbon atoms; wherein A^1 is alkylene of 1 to 6 carbon atoms; wherein R^2 is hydrogen or alkyl of up to 6 carbon atoms; and wherein R^3 is hydrogen or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; and wherein Y is α-arylalkyl, or, tertiary-alkyl or.

4,085,137
POLY(PERFLUOROALKYLENE OXIDE) DERIVATIVES

Ronald A. Mitsch, Little Canada, and Joseph La Mar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 373,200, Jun. 25, 1973, which is a continuation-in-part of Ser. No. 805,885, Mar. 10, 1969, abandoned, and Ser. No. 70,540, Sep. 8, 1970, Pat. No. 3,810,874, which is a continuation-in-part of Ser. No. 805,885,. This application Aug. 28, 1975, Ser. No. 608,717
Int. Cl.[2] C07C *103/147*
U.S. Cl. 260—561 HL 4 Claims

1. Linear hydroxy-terminated poly(perfluoroalkylene oxide) compounds having a number average molecular weight of 500 to 10,000 and the general formula

$$R\text{—}FC_2O\text{—}(CF_2CF_2O)_m(CF_2O)_nCF_2\text{—}R'$$

where R and R′ are $-C(O)N(R'')CH_2CH_2OH$ where R″ is hydrogen, lower alkyl of 1 to 8 carbon atoms, or ethylol, where *m* and *n* designate randomly distributed perfluoroethyleneoxy and perfluoromethyleneoxy backbone subunits, respectively, the ratio *m*/*n* being 0.2/1 to 5/1, said compounds having a glass transition temperature lower than −78° C and polymerizable to polyurethanes having recurrent backbone

units of the formula $-CF_2O-(CF_2CF_2O)_m(CF_2O)_n-CF_2-$ which impart to the polyurethanes a glass transition temperature lower than −78° C.

4,085,138

PROCESS FOR OPTICAL RESOLUTION OF CRUDE TRANS-1,2-CYCLOHEXANEDIAMINE

Thomas A. Whitney, Roselle, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 3, 1976, Ser. No. 711,138
Int. Cl.² C07C *87/38, 87/40*
U.S. Cl. 260—563 R **19 Claims**

1. A process for the optical resolution of racemic trans-cyclohexanediamine from a crude feedstream mixture of amines containing said racemic trans-cyclohexanediamine, said process comprising the steps of preparing a substantially aqueous solution containing a quantity of the crude amine feedstream, d- or l-tartaric acid, depending upon which optical isomer is desired, a second acid selected from the group consisting of C_1 to C_7 monocarboxylic acids, C_3 to C_8 α, Ω difunctional carboxylic acids, HCl and mixtures thereof, and sufficient substantially aqueous medium to insure dissolution of the tartrate salts, heating the resulting mixture to a temperature sufficient to achieve dissolution of all components, seeding the hot mixture with a crystal of optically pure (+)—DACH•l-tartrate or (−)—DACH•d-tartrate, depending upon which optically active species is desired, cooling the mixture to room temperature, and separating the crystals which come out of solution.

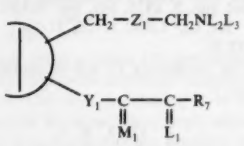
4,085,139

2-DECARBOXY-2-AMINO-METHYL-PGE AND PGD ANALOGS

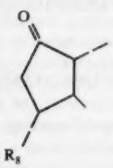
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 645,276, Dec. 29, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 719,053
Int. Cl.² C07C *87/24;* A61K *31/13, 31/135*
U.S. Cl. 260—563 R **706 Claims**

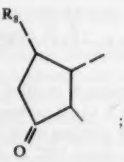
1. A prostaglandin analog of the formula



wherein D is

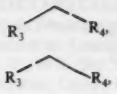


or

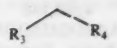


;

wherein R_8 is hydrogen or hydroxy;
wherein L_1 is

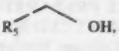


or a mixture of



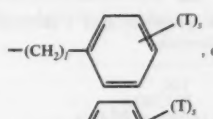
and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the provisio that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein L_2 and L_3 are hydrogen or alkyl of one to 4 carbon atoms, inclusive;
wherein M_1 is

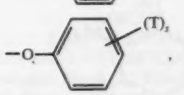


or

wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,
(2) cis—CH=CH—CH_2CH_3,

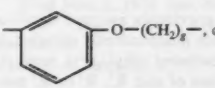


(3)



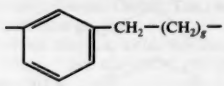
(4)

wherein l is zero to three, inclusive, wherein m is one to 5, inclusive, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) $-CH_2CH_2-$, or
(4) $-C\equiv C-$; and
wherein Z_1 is
(1) cis—CH_2—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) $-(CH_2)_3-(CH_2)_g-CH_2-$,
(5) $-(CH_2)_3-(CH_2)_g-CF_2-$,
(6) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,
(7) $-(CH_2)_2-O-(CH_2)_g-CH_2-$,
(8) $-(CH_2)_3-O-(CH_2)_g-$,



(9)

-continued



(10)

wherein g is zero, one, two, or three.

4,085,140

CARBODIIMIDES

Arthur Ibbotson, Manchester, England, assignor to Imperial Chemical Industries Limited, United Kingdom

Filed Aug. 23, 1977, Ser. No. 827,097

Claims priority, application United Kingdom, Sep. 22, 1976, 39266/76

Int. Cl.[2] C07C *119/055*

U.S. Cl. 260—566 R **6 Claims**

1. In a process for the conversion of isocyanate groups to carbodiimide groups which comprises contacting a compound containing isocyanate groups with a cyclic phosphorus compound which catalyses said conversion the improvement which comprises carrying out said conversion in the presence of a nitrogeneous base selected from 1,4-diazobicyclo-[2,2,2]-octane, N,N-dimethylcyclohexylamine, triethylamine, pyrrolizidine and tetramethylguanidine.

4,085,141

PROCESS FOR THE PREPARATION OF ANILINES META-SUBSTITUTED BY CHLORINE

Karlfried Wedemeyer, Cologne; Wolfgang Kiel, Schildgen, and Werner Evertz, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

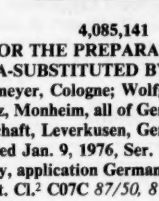
Filed Jan. 9, 1976, Ser. No. 647,967

Claims priority, application Germany, Jan. 27, 1975, 2503187

Int. Cl.[2] C07C *87/50, 87/52, 93/14*

U.S. Cl. 260—570 R **30 Claims**

1. A process for the preparation of a chlorine meta-substituted aniline of the formula



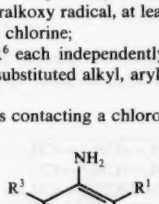
(II)

wherein

X^1 and X^2 are identical or different and represent chlorine, hydrogen or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aralkoxy radical, at least one of said radicals X^1 or X^2 being chlorine;

R^4, R^5 and R^6 each independently being hydrogen or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aryloxy radical

which comprises contacting a chloroaniline of the formula



(I)

wherein

X^1 and X^2 have the previously assigned significance;

R^1, R^2 and R^3 are each independently chlorine, hydrogen or an optionally substituted alkyl, aryl, aralkyl, alkoxy or aryloxy, at least one of said R^1, R^2 or R^3 members being chlorine, with hydrogen in a solution in an acid medium in the presence of a noble metal.

4,085,142

2-ARYL-6-ARYLIDENE-1-(SUBSTITUTED AMINOALKOXY)-1-CYCLOHEXENES

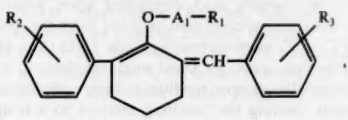
Chester F. Turk, Kendall Park, and John Krapcho, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 25, 1977, Ser. No. 771,867

Int. Cl.[2] C07C *93/06*

U.S. Cl. 260—570.5 CA **9 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 is alkylamino or dialkylamino;

R_2 and R_3 are the same or different and are hydrogen, chloro, fluoro, alkyl, alkoxy or trifluoromethyl; and

A_1 is alkylene having 2 to 5 carbon atoms; wherein the terms alkyl and alkoxy refer to groups having 1 to 8 carbon atoms.

4,085,143

MANUFACTURE OF α,β-UNSATURATED ACIDS AND ANHYDRIDES

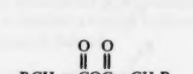
Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1975, Ser. No. 583,937

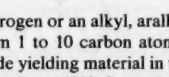
Int. Cl.[2] C07C *51/00, 51/54*

U.S. Cl. 260—515 R **15 Claims**

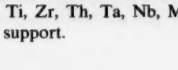
1. A process for producing an α,β-unsaturated acid anhydride of the type



and an α,β-unsaturated acid of the type



which comprises the steps of reacting an anhydride having the formula



wherein R can be hydrogen or an alkyl, aralkyl, or aryl hydrocarbon moiety of from 1 to 10 carbon atoms with formaldehyde or a formaldehyde yielding material in the vapor phase at a temperature of from about 190° C. to about 400° C. in the presence of an oxide of a metal selected from the group consisting of Ag, U, Zn, Ti, Zr, Th, Ta, Nb, Mo, W, and Sn, supported on an inert support.

4,085,144
N,N'-BRIDGED-BIS(2-ALKYL-2-HYDROXYETHYLAMINE) DIOXIDES

Guy D. Diana, Stephentown, and Royal A. Cutler, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 582,646, Jun. 2, 1975, Pat. No. 4,022,833, which is a division of Ser. No. 332,267, Feb. 14, 1973, Pat. No. 3,928,427, which is a continuation-in-part of Ser. No. 123,097, Mar. 10, 1971, abandoned. This application Nov. 8, 1976, Ser. No. 739,447

Int. Cl.[2] C07C *91/12, 91/14;* A61K *31/13*

U.S. Cl. 260—584 R 9 Claims

1. N,N'-(X)-bis[N-(R')-2-(R)-2-(ZO)-ethylamine] N,N'-dioxide wherein:

R is alkyl of three to fifteen carbon atoms;

R' is a tertiary alkyl of one to four carbon atoms;

X is alkylene of two to twelve carbon atoms with bonds to the nitrogen atoms at different carbon atoms;

the sum of the number of carbon atoms of R and X is at least nine; and

Z is hydrogen.

4,085,145
PROCESS FOR MANUFACTURING CARBONYL COMPOUNDS BY OXIDATION WITH MOLECULAR OXYGEN OF OLEFINIC COMPOUNDS IN LIQUID PHASE IN THE PRESENCE OF SOLUBLE BIMETALLIC CATALYSTS

Hubert Mimoun, Rueil Malmaison; Do Thao, Le Pecq, and Irénee Seree de Rochi, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 13, 1976, Ser. No. 686,245

Claims priority, application France, May 13, 1975, 75 15110

Int. Cl.[2] C07C *45/10*

U.S. Cl. 260—592 10 Claims

1. In a liquid phase process for producing carbonyl compounds by oxidation with molecular oxygen of olefins of the formula $CH_2 = CH - R_2$ containing 3–16 carbon atoms per molecule wherein R_2 is an alkyl, aryl, alkylaryl or aralkyl, which process is performed in the presence of a catalytic system comprising both at least one compound (A) of the formula $M_1X_nL_m$, and at least one compound (B) of the formula $M_2Z_pL'_qX$ is an anionic group being a halogen, a carboxylate, a sulfate, a nitrate, a perchlorate, a thiocyanate, a tetrafluoroborate, an acetylacetonate or a cyclopentadienyl, Z is an anionic group being a halogen, a carboxylate, a sulfate, a nitrate, a perchlorate or a tetrafluoroborate, *n, m* and *p* are integers selected from 1, 2 and 3, M_2 is a metal being iron, cobalt, nickel or copper, *q* is zero or an integer from 1 to 6, inclusive, L is a coordinate being H_2O, a mono-olefin, a poly-olefin, a phosphine, dimethylsulfoxide or acetylacetonate, and L' is a coordinate being H_2O, dimethylformamide, hexamethylphosphoramide or dimethylsulfoxide,

wherein the improvement comprises conducting the said process under maintained anhydrous conditions in an anhydrous organic solvent selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, 2-butanol, 3,3-dimethyl-2-butanol, 2-octanol, cyclohexanol, methyl phenyl carbinol, ethylene glycol, 1,2-propane diol, glycerol and glycol monomethyl ether, and wherein M_1 is rhodium.

4,085,146
PROCESS FOR PREPARING O-HYDROXYARYLALDEHYDES

Geoffrey Ernest Beswick, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

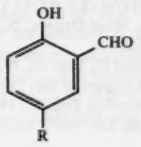
Filed Nov. 23, 1976, Ser. No. 744,279

Claims priority, application United Kingdom, Dec. 15, 1975, 51286/75

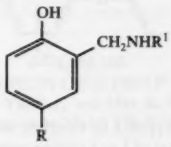
Int. Cl.[2] C07C *45/16*

U.S. Cl. 260—600 R 10 Claims

1. A process for the manufacture of an o-hydroxyarylaldehyde of the formula:



wherein R is an alkyl group of from 7 to 12 carbon atoms which comprises the steps of (1) oxidizing a 2-arylaminomethyl phenol of the formula:



wherein $—NHR^1$ is the residue of an aromatic amine selected from aniline, p-toluidine, o-anisidine and p-chloroaniline with ferric sulphate or ammonium persulphate under acid conditions in aqueous medium at 40° to 100° C. to the corresponding 2-hydroxybenzylidenearylamine and (2) hydrolyzing said amine to the o-hydroxyarylaldehyde by heating with aqueous acid.

4,085,147
PREPARATION OF META-ARYLOXY-BENZALDEHYDES

Herbert P. Rosinger; Derek A. Wood, both of Sittingbourne, England, and Roger A. Sheldon, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 26, 1977, Ser. No. 762,541

Claims priority, application United Kingdom, Feb. 5, 1976, 4577/76; Jul. 2, 1976, 27675/76

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—600 R 12 Claims

1. A process for preparing meta-phenoxybenzaldehyde, which comprises bringing together

(a) hexamethylenetetramine and

(b) a mixture of a meta-phenoxybenzyl halide and a meta-phenoxybenzal halide, wherein the halogen is bromine or chlorine, and treating the resulting product with an aqueous solution of acetic acid, said solution having a pH in the range of 5 to 6, at a temperature in the range of 80° C to 120° C.

4,085,148
PREPARATION OF HALOGENATED ALDEHYDES

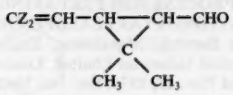
Peter John Vernon Cleare, Ascot, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 1, 1976, Ser. No. 737,274

Int. Cl.[2] C07C *47/24*

U.S. Cl. 260—601 H 3 Claims

1. A compound of formula:



wherein each Z represents chlorine or bromine.

4,085,149

α-ALKYL-P-PHENOXY BENZYL ALCOHOLS

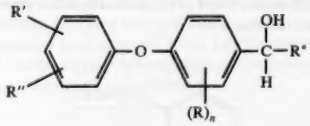
Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 510,477, Sep. 30, 1974, Pat. No. 3,962,459, which is a continuation-in-part of Ser. No. 394,181, Sep. 4, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,125

Int. Cl.[2] C07C *43/20*

U.S. Cl. 260—613 R **7 Claims**

1. A compound of the formula:



wherein:

R° is branched alkyl of 3 to 5 carbon atoms,

R is hydrogen, alkyl of 1 to 4 carbon atoms or halo of atomic weight of from 18 to 36,

n is 1 or 2,

R′ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms, and

R″ is hydrogen, alkyl of 1 to 4 carbon atoms, halo of atomic weight of from 18 to 36 or alkoxy of 1 to 4 carbon atoms,

provided that when R, R′ and R″ each signifies hydrogen, then R° signifies other than $—C(CH_3)_3$.

4,085,150

PROCESS FOR THE ORTHO ALKYLATION OF PHENOLS IN THE PRESENCE OF A COPPER-ZINC-ALUMINUM MIXED OXIDE CATALYST

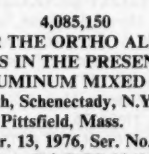
William Edward Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1976, Ser. No. 676,502

Int. Cl.[2] C07C *39/06*

U.S. Cl. 260—621 R **3 Claims**

1. A process for the selective ortho-alkylation of a phenolic compound of the general formula:



wherein each R is a monovalent substituent selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, aryl of 6 to 12 carbon atoms and alkaryl of 7 to 12 carbon atoms, the process comprising reacting at a temperature of from 185° C to about 350° C in the presence of a copper-zinc-aluminum mixed oxide catalyst said phenolic compound with an alkanol of 1 to about 12 carbon atoms.

4,085,151

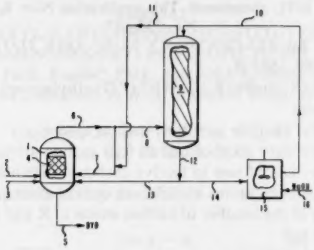
BUTYNEDIOL PRODUCTION

Dennis Joseph Zak, Houston, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1977, Ser. No. 811,283

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—635 Y **3 Claims**



1. In the process for the production of butynediol by reacting acetylene and formaldehyde in a reactor in the presence of a particulate copper acetylide catalyst in an agitated aqueous medium at 60° to 120° C and at a pH of 5.0 to 8.0, where the gaseous overhead from the reactor is recycled to the reactor, the improvement comprising feeding at least part of the gaseous overhead into a countercurrent absorption tower wherein it is contacted with an aqueous solution of sodium carbonate or a mixture of sodium carbonate and sodium bicarbonate to remove the carbon dioxide produced in the reactor, the gas stream then being recycled to the reactor, and the liquid bottoms from the absorption tower containing sodium carbonate and sodium bicarbonate being split into two parts, one part being fed into the reactor in an amount sufficient to maintain the pH of 5.0 to 8.0 and the remainder being contacted with sufficient sodium hydroxide to convert the sodium bicarbonate created by absorption of the carbon dioxide into sodium carbonate, and recycling the converted stream to the absorption tower.

4,085,152

PRODUCTION OF HEXANITROSTILBENE

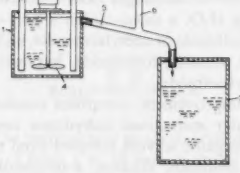
David Anthony Salter, Sawbridgeworth; Norman Frederick Scilly, Bishop's Stortford, and Keith Ellis Watson, Thorverton, near Exeter, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jan. 18, 1977, Ser. No. 760,328

Claims priority, application United Kingdom, Jan. 22, 1976, 2501/76

Int. Cl.[2] C07C *79/10, 76/02*

U.S. Cl. 260—645 **20 Claims**



1. In a process for the production of 2,2′,4,4′,6,6′ - hexanitrostilbene by reaction of a solution of 2,4,6 - trinitrotoluene with an alkali metal or alkaline earth metal hypochlorite to

precipitate the product and separation thereof from the solvent, the improvement comprising adding a nitrogenous base to the reaction mixture after commencement of said reaction of 2,4,6 - trinitrotoluene with the hypochlorite.

4,085,153

BROMINATION OF UNREACTIVE OLEFINS WITH BROMINE CHLORIDE

John A. Schneider, and Jack F. Mills, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 819,537, Apr. 24, 1969, abandoned. This application May 2, 1974, Ser. No. 466,097

Int. Cl.[2] C07C *25/00*

U.S. Cl. 260—649 R **8 Claims**

1. A process for brominating the carbon atom pair connected by a double bond in an olefin in which each carbon of said carbon atom pair carries at least one substituent selected from the group consisting of fluorine, chlorine, bromine, iodine and phenyl, comprising reacting by contacting the olefin with bromine chloride in a two-phase, aqueous-organic reaction medium containing an inorganic bromide salt, selected from the group consisting of alkali metal bromide, alkaline earth metal bromide and ammonium bromide, dissolved in the aqueous phase, the organic reaction medium being selected from the group consisting of said olefin and a mixture of such olefin with an inert hydrophobic organic solvent.

4,085,154

HYDROCARBON DEHYDROGENATION USING A NONACIDIC CATALYST OF A PLATINUM GROUP METAL, RHENIUM, COBALT, TIN, AND AN ALKALI OR ALKALINE EARTH METAL ON A POROUS CARRIER

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 681,007, May 18, 1976, Pat. No. 4,013,735, which is a continuation-in-part of Ser. No. 564,386, Apr. 2, 1975, Pat. No. 3,960,711. This application Feb. 22, 1977, Ser. No. 771,127

Int. Cl.[2] C07C *5/18*

U.S. Cl. 260—668 D **17 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.05 to about 5 wt. % cobalt, and about 0.01 to about 5 wt. % tin; wherein the platinum group metal, rhenium, catalytically available cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

4,085,155

PREPARATION OF ALKYL SUBSTITUTED 1,3-DIMETHYLBENZENES

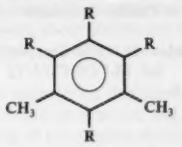
Thomas E. Goodwin, College Station, Tex., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 738,931, Nov. 4, 1976, abandoned. This application May 2, 1977, Ser. No. 793,110

Int. Cl.[2] C07C *1/20*

U.S. Cl. 260—668 R **10 Claims**

1. A process for preparing alkyl substituted benzenes, containing at least 5 alkyl groups, said alkyl substituted benzenes being represented by the formula



wherein R is hydrogen or a C_1–C_{15} alkyl group, with at least three of the R substituents being alkyl groups, by a process which comprises reacting acetone and 1-alkanol, containing 1 to 15 carbon atoms, in the presence of an effective amount of a catalyst, selected from the group consisting of titanium dioxide, synthetic silica-alumina, and alumina at a temperature in the range of about 200° to about 550° C. and a pressure in the range of about 0 to about 2,000 psig, said process being characterized further in that:

a. the amount of alkanol to acetone, on a molar basis, is in the range of about 0.3:1 to about 15:1,

b. the liquid hourly space velocity (volume), of liquid to catalyst, is in the range of about 0.1 to about 1,000.

4,085,156

CONVERSION OF HYDROCARBONS

Vincent J. Frilette, Yardley, and Mae K. Rubin, Bala Cynwyd, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 697,610, Jan. 15, 1968, Pat. No. 3,597,493, which is a continuation of Ser. No. 494,228, Oct. 8, 1965, abandoned, which is a continuation of Ser. No. 142,778, Oct. 4, 1961, abandoned. This application Jul. 23, 1971, Ser. No. 165,702

Int. Cl.[2] C07C *3/52*

U.S. Cl. 260—671 R **16 Claims**

1. In a method wherein a charge stock comprising paraffins and an alkylatable aromatic hydrocarbon are subjected to cracking conditions carried out at temperatures between about 500° and 1000° F., the improvement of carrying out said cracking in the presence of a crystalline aluminosilicate catalyst having a silica to alumina ratio of at least 10.

4,085,157

NEW CATALYSTS FOR HYDROCARBON CONVERSION TO AROMATICS

Bernard Juguin, Rueil-Malmaison; Jean Cosyns, Nanterre; Jean-François LePage, Rueil-Malmaison, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Division of Ser. No. 620,410, Oct. 7, 1975, Pat. No. 4,043,944. This application Feb. 22, 1977, Ser. No. 770,712

Claims priority, application France, Oct. 11, 1974, 74 34392

Int. Cl.[2] C07C *3/03;* C10G *35/06;* B01J *27/06, 23/48*

U.S. Cl. 260—673 **11 Claims**

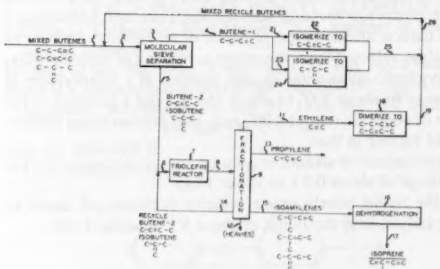
1. In a process for the production of aromatic hydrocarbon by cyclization, dehydrogenation or dehydrocyclization of an appropriate starting compound over a catalyst, the improvement which comprises employing as said catalyst, a catalyst consisting essentially of (a) a carrier and, expressed in proportion by weight with respect to the carrier, (b) 0.005 to 2% of platinum, (c) 0.005 to 1% of a metal selected from the group consisting of iridium, rhodium and ruthenium, (d) 0.05 to 0.8% of cobalt, (e) 0.005 to 1% of at least one metal selected from the group consisting of copper, manganese, silver and gold, and (f) 0.1 to 10% of at least one halogen.

4,085,158

ISOAMYLENES FROM BUTENES

Rolland E. Dixon, and P. Douglas Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1976, Ser. No. 666,102
Int. Cl.[2] C07C 11/12
U.S. Cl. 260—680 E **22 Claims**



1. A method of preparation of isoamylenes from a mixed butenes feed stream comprising butene-1, butenes-2, and isobutene, wherein said process comprises the steps:

(a) contacting said mixed butenes stream with molecular sieve separation means whereby said butene-1 is substantially adsorbed and said butenes-2 and isobutene pass therethrough as a raffinate,

(b) disproportionating said raffinate of isobutene and butenes-2 which can futher contain propylene in an effective disproportionation mole ratio of butenes-2 and isobutene, thereby forming a stream comprising isoamylenes, unconverted butenes-2, isobutene, propylene, and which can contain ethylene, wherein said mole ratio is about 1:1 isobutene: butenes-2 plus propylene where employed

(c) separating said stream comprising isoamylenes into streams comprising propylene, butenes-2 and isobutene, said isoamylenes, and optionally an ethylene stream when said isoamylene stream further contains said ethylene,

(d) recycling said separated butenes-2 and isobutenes to said disproportionating step,

(e) desorbing said adsorbed butene-1, thereby producing a desorbed butene-1 stream,

(f) isomerizing said desorbed butene-1 stream at least in part to at least one of further butenes-2, or isobutene, or both, so as to provide an effective mole ratio of butenes-2: isobutene for said step (b) in combination with butenes-2 and isobutene from said mixed feed,

(g) recycling said further butenes-2, isobutene, or both, and any unconverted butene-1, to said molecular sieve separation step,

(h) dimerizing as necessary at least a proportion of said ethylene when present to produce a dimerized steam of additional butenes and cycling said additional butenes to said step (a), wherein said ethylene dimerization assists in maintaining a proper butenes-2: isobutene disproportionation mole ratio for said step (b) thereby providing a method of preparation of isoamylenes from a mixed butenes feed stream providing for internal adjustments in order to provide for a balanced mole ratio for said disproportionation step (b).

4,085,159

PROCESS FOR THE PREPARATION OF POWDERED THERMOSETTING COMPOSITIONS BASED ON BRANCHED-CHAIN CARBOXYL GROUP-CONTAINING POLYESTERS AND EPOXY COMPOUNDS

Arthur Marsiat, Brussels, Belgium, assignor to U C B, Societe Anonyme, Saint-Gilles-les-Brussels, Belgium

Filed Apr. 28, 1976, Ser. No. 681,342
Claims priority, application United Kingdom, Apr. 29, 1975, 17740/75
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—835 **18 Claims**

1. A process for the preparation of a powdered thermosetting coating composition suitable for application as paint or varnish or electricity-conducting articles by electrostatic powder spray or fluidized bed coating processes, which comprises

in a first stage, preparing a branched-chain hydroxyl group-containing polyester having a hydroxyl number between 50 and 100 by reacting (1) at least one aromatic dicarboxylic acid, (2) at least one aromatic tricarboxylic acid or pyromellitic acid and (3) an excess of at least one organic dihydric compound, the ratio of carboxyl equivalents of the tricarboxylic acid or pyromellitic acid to carboxyl equivalents of the dicarboxylic acid being from 5:95 to 35:65;

in a second stage, esterifying said branched-chain hydroxyl group-containing polyester with an aromatic or hydroaromatic dicarboxylic acid to produce a branched-chain carboxyl group-containing polyester having a molecular weight of from 1,000 to 3,000 and an acid number between 50 and 100, which acid number is substantially equal to the hydroxyl number of said hydroxyl group-containing polyester;

in a third stage, homogeneously mixing said branched-chain carboxyl group-containing polyester with a solid epoxy compound containing at least two epoxy groups, the ratio of said epoxy compound to said carboxyl group-containing polyester being such that there are 0.7 to 1.3 equivalents of epoxy groups per equivalent of carboxyl groups in said carboxyl group-containing polyester; and

converting the resulting homogeneous mixture into a powder.

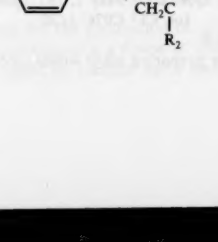
4,085,160

PRE-ACCELERATED RESIN COMPOSITION

Thomas F. Anderson, and Arlington L. Hartless, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 574,155, May 2, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 731,980
Int. Cl.[2] C08L 63/02, 63/04
U.S. Cl. 260—837 R **6 Claims**

1. A polymerizable resin composition containing a polymerization accelerator and having a relatively constant gel time over extended periods of storage which comprises (1) a terminally unsaturated vinyl ester resin prepared by reacting an unsaturated monocarboxylic acid with a polyepoxide in about equivalent amounts (2) about 20 to about 60 weight percent of at least one unsaturated copolymerizable monomer and (3) about 0.10 to 1.2 weight percent based on the weight of said resin plus any copolymerizable monomers of an accelerator having the formula



where R_1 and R_2 independently are H or a 1 to 4 carbon alkyl group.

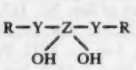
4,085,161

ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF COPOLYMERS OF POLYETHYLENICALLY UNSATURATED EPOXY ADDUCTS INCLUDING BLOCKED ISOCYANATE MONOMER

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 1, 1976, Ser. No. 737,729
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—837 R **12 Claims**

1. Nongelled, amine-functional copolymers dispersible in water with the aid of a solubilizing acid constituted by a copolymer of (A) 5% – 75% of an ethylenically unsaturated hydroxy-functional adduct of a diepoxide having the formula



in which R is a copolymerizable ethylenically unsaturated organic radical, Y is the residue of a substituent selected from hydroxy and primary amine, and Z has the structure of a diepoxide having an average molecular weight of at least about 350 and in which the epoxy groups are replaced by the OH groups shown in the formula; (B) copolymerizable monoethylenically unsaturated monomers including 2% – 30% of tertiary amine-functional monomer; and (C) 2% – 50% of a blocked monoethylenically unsaturated derivative of a polyisocyanate in which all of the isocyanate groups are blocked except for one which carries the single unsaturated group, said proportions being based on the weight of the copolymer.

4,085,162

POLYOLEFIN WITH PHOSPHORYLATED NOVOLAC AND TRIALLYL CYANURATE

Burton Thornley MacKenzie, Jr., Monroe, and Edward Vincent Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 516,468, Oct. 21, 1974, Pat. No. 3,930,104. This application Dec. 8, 1975, Ser. No. 638,620
Int. Cl.[2] C08G *8/36*; C08L *23/16, 61/14*
U.S. Cl. 260—848 **14 Claims**

1. A flame-resistant polyolefin compound comprising the combination of phosphorylated novolak phenol-formaldehyde and triallyl cyanurate, said phosphorylated novolak phenol-formaldehyde being the reaction product of phenol-formaldehyde condensation novolak resin and triphenylphosphate.

4,085,163

MULTICOMPONENT POLYAMIDE-BLOCK COPOLYMER-POLYMER BLENDS

William P. Gergen, and Sol Davison, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 693,462, Jun. 7, 1976, Pat. No. 4,041,103. This application Apr. 22, 1977, Ser. No. 790,125
Int. Cl.[2] C08L *75/00*
U.S. Cl. 260—857 D **31 Claims**

1. A composition comprising the admixture obtained by initimately mixing about 4 to about 40 parts by weight of a block copolymer, about 5 to about 48 parts by weight of at least one dissimilar engineering thermoplastic, and a polyamide in a weight ratio of polyamide to dissimilar engineering thermoplastic of greater than 1:1, so as to form a polyblend wherein at least two of the polymers have at least partial continuous interlocked networks with each other and wherein:

(a) said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer mid block B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000;

(b) said polyamide has a molecular weight in excess of about 10,000; and

(c) said dissimilar engineering thermoplastic resin is capable of forming a continuous structure and is selected from the group consisting of polyolefins, thermoplastic polyesters, poly(aryl ethers), poly(aryl sulfones), polycarbonates, acetal resins, thermoplastic polyurethanes, halogenated thermoplastics, and nitrile barrier resins.

4,085,164

THERMOSETTING COMPOSITIONS BASED ON A BIS-IMIDE AND A POLYURETHANE

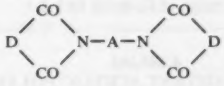
Max Gruffaz, La Mulatiere, and Jean Louis Locatelli, Vienne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 17, 1975, Ser. No. 623,425
Claims priority, application France, Oct. 21, 1974, 74 35311
Int. Cl.[2] C08G *18/83*; C08L *75/06*
U.S. Cl. 260—858 **11 Claims**

1. A curable composition which consisting essentially of

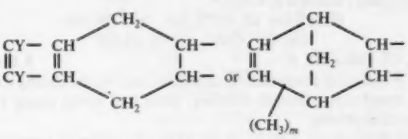
A. an imide-group-containing compound chosen from the group consisting of:

a. a bis-imide of the formula:



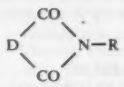
(I)

in which D represents a radical chosen from the group consisting of the radicals of the formula:



in which Y represents H, CH_3 or Cl, *m* is 0 or 1, and A represents a divalent organic radical containing 2 to 30 carbon atoms, and

b. a mixture comprising a bis-imide of formula (I) and a mono-imide of the formula:



(II)

in which D is as defined above and R represents a hydrogen atom or a monovalent organic radical containing from 1 to 20 carbon atoms; and

B. a polyurethane elastomer, in amounts such that the weight ratio

$$\frac{\text{polyurethane}}{\text{compound with imide groups}}$$

is from 1/5 to 4/1, and optionally

C. an aromatic compound which possesses 2 to 4 benzene rings, is not sublimable at atmospheric pressure at up to 250° C. and has a boiling point of at least 250° C.

4,085,165

POLYURETHANE COMPOSITION

Fumio Odaka, Kawagoe; Yoshihiko Fujii, Higashi Murayama, and Yutaka Iseda, Tachikawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,906
Claims priority, application Japan, Dec. 29, 1973, 48-3631
Int. Cl.[2] C08G *18/04;* C08L *75/06, 75/08*
U.S. Cl. 260—859 R **17 Claims**

1. A polyurethane composition produced by mixing

(a) 100 parts by weight of prepolymer selected from the group consisting of polyether, polyester, and polyunsaturated hydrocarbon, the prepolymer having terminal isocyanate groups and having number average molecular weight in the range of from 800 to 20,000,

(b) 5 - 30 parts by weight of a radical polymerizable vinyl compound or a mixture thereof, and

(c) 0.05 - 1.0 part by weight of a radical initiator selected from the group consisting of 1,1'-bis-t-butyl peroxy-3,3,5-trimethylcyclohexane, benzoyl peroxide, t-butyl peroxybenzoate, t-butyl peroxy-2-ethylhexanoate, lauroyl peroxide, azo-bis-isobutyronitrile, decanoyl peroxide, propionyl peroxide, succinic acid peroxide, acetyl peroxide, t-butyl peroxyisobutyrate, t-butyl peroxymaleic acid, t-butyl peroxylaurate, cyclohexanone peroxide, t-butyl peroxyisopropyl carbonate, 2,5-dimethyl-2,5-di(2-ethylhexylperoxy) hexane, t-butyl peroxyacetate and mixtures thereof;

adding (d) a curative selected from the group consisting of polyamine and polyol; and

curing the resulting mixture by heating at 70° - 140° C to produce an elastomeric polyurethane, the equivalent ratio of the active hydrogen of (d) to the isocyanate groups of (a) being in the range of from 0.8 to 1.2.

4,085,166

IMPACT RESISTANT ACRYLIC POLYMER COMPOSITION

Roland Ralph DiLeone, Rowayton, and Albert George Robustelli, Darien, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 18, 1977, Ser. No. 798,200
Int. Cl.[2] C08L *51/00, 53/00*
U.S. Cl. 260—876 R **8 Claims**

1. A molding composition characterized by exhibiting excellent toughness, thermal stability, flow and stress craze resistance comprising

(A) from about 70% to about 95% of a resinous terpolymer comprising from about 65 to 75 parts of methylmethacrylate, from about 18 to 24 parts of styrene and from about 2 to 12 parts of ethylacrylate and

(B) from about 5% to about 30% of polybutadiene grafted with from about 17 to 22 parts of methylmethacrylate, from about 4 to 7 parts of styrene and 0 to 3 parts of ethylacrylate, the ratio of polybutadiene to monomer in (B) ranging from about 1:1 to about 4:1, respectively

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4,085,167

CARBOXYLIC POLYMERIC THICKENERS

Sheldon N. Lewis, Willow Grove, and John J. Miller, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 6, 1972, Ser. No. 312,433
Int. Cl.[2] C08F *214/14, 220/40, 265/04, 265/06*
U.S. Cl. 260—885 **8 Claims**

1. A solid polymer of a polymerizable mixture consisting essentially of: A. at least about 30% by weight, of the polymer, of a monoethylenically α,β-unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, ethacrylic acid, α-chloroacrylic acid, crotonic acid, itaconic acid, maleic acid, fumaric acid, citraconic acid, mesaconic acid and mixtures of same, and B. an oligomer having a number average molecular weight of from about 400 to about 10,000 wherein the oligomer is an unhydrolyzed or partially-hydrolyzed oligomer of allyl methacrylate or a (C_3-C_7)allyloxyalkyl methacrylate; wherein the average chain length of the oligomer is about 6 to about 50 mers, and wherein at least about 85% of the molecules of the oligomer have chain lengths of about $\sqrt{2}n$ to about $2n$ mers, wherein n represents the average chain length of the oligomer; and wherein the oligomer comprises about 0.1% to about 10% by weight of the mixture.

4,085,168

CHEMICALLY JOINED, PHASE SEPARATED SELF-CURED HYDROPHILIC THERMOPLASTIC GRAFT COPOLYMERS AND THEIR PREPARATION

Ralph Milkovich, Naperville, and Mutong T. Chiang, Palos Heights, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 432,788, Jan. 11, 1974, which is a continuation-in-part of Ser. No. 117,733, Feb. 21, 1971, abandoned, Ser. No. 244,205, Apr. 14, 1972, Pat. No. 3,832,423, and Ser. No. 282,099, Aug. 21, 1972, Pat. No. 3,786,116. This application May 7, 1975, Ser. No. 575,286
Int. Cl.[2] C08L *31/04, 29/04*
U.S. Cl. 260—886 **12 Claims**

1. A chemically joined, phase separated self-cured hydrophilic thermoplastic graft copolymer of:

1. at least one copolymerizable normally hydrophobic macromolecular monomer having a substantially uniform molecular weight distribution, and

2. at least one hydrophilic (water-soluble) copolymerizable comonomer or compound rendered hydrophilic forming the polymeric backbone of said copolymer, said copolymerizable normally hydrophobic macromolecular monomer forming linear polymeric sidechains of said graft copolymer, wherein:

a. the polymeric backbone of the graft copolymer is comprised of polymerized units of said copolymerizable comonomers, wherein the copolymerizable comonomers are selected from the group consisting of hydroxyalkyl and hydroxyalkoxyalkyl esters of acrylic and methacrylic acids, N-hydroxyalkyl and N,N-bis-hydroxyalkyl amides of acrylic and methacrylic acids, vinyl esters of monocarboxylic acids which are rendered hydrophilic by hydrolysis of said vinyl esters subsequent to copolymerization, N-vinyl pyrrolidone, N-vinyl piperidone, N-acrylylpyrrolidone, N-acrylylpiperidine, N-acrylylmorpholine, quaternary ammonium salts of ethylenically unsaturated compounds, and mixtures thereof;

b. the linear polymeric sidechains of the graft copolymer consist essentially of a polymerized hydrophobic macromolecular monomer, said hydrophobic macromolecular monomer comprising a linear polymer or copolymer having a molecular weight of at least about 2,000 and having a substantially uniform molecular weight distribution, such that its ratio of $\overline{M}w/\overline{M}n$ is not substantially above about 1.1, said macromolecular monomer being further characterized as having no more than one copolymerizable moiety per linear polymer or copolymer chain, said copolymerization occurring between the copolymerizable end group of said hydrophobic macromolecular monomer and said copolymerizable hydrophilic comonomer; and

c. the linear polymeric sidechains of the graft copolymer which are copolymerized into the copolymeric backbone are separated by at least about 20 uninterrupted recurring monomeric units of said hydrophilic polymeric backbone, the distribution of the sidechains along the backbone and the copolymerization being controlled by the reactivity ratio of the copolymerizable end groups on said hydrophobic macromolecular monomer and said copolymerizable hydrophilic comonomer.

4,085,169
PROCESS FOR PREPARING STYRENIC POLYMER PARTICLES

Fumio Saito, Tsurunosato Ohtsu; Fumito Yamai, Kusatsu; Yositugu Beppu, Shiga, and Shinpei Nakayama, Kusatsu, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka and Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, both of Japan

Continuation of Ser. No. 381,460, Jul. 23, 1973, abandoned. This application Sep. 29, 1975, Ser. No. 617,624

Int. Cl.[2] C08F *257/02*

U.S. Cl. 260—886 **6 Claims**

1. A process for reducing the amount of powdery polymer particles which pass through a 32 mesh sieve to thereby obtain styrenic polymer particles having a uniform particle size of 0.6 to 3 mm by preparing styrenic polymer particles by the suspension polymerization of a system comprising styrenic monomer droplets and styrenic polymer particles using the styrenic monomer and styrenic polymer particles as raw materials, which comprises suspending styrene homopolymer particles or copolymer particles of styrene monomer and up to 50% by weight of a different copolymerizable ester monomer comprising an alkyl alcohol having from 1 to 12 carbon atoms and being selected from the group consisting of acrylic esters, methacrylic esters, maleic esters and fumaric esters, having particle sizes of 0.4 to 1.8 mm in water containing a suspending agent selected from the group consisting of a water-soluble high molecular weight material and a slightly soluble inorganic material and adding to the suspension styrene monomer with up to 50% by weight of a different copolymerizable monomer selected from the group consisting of methylacrylate, ethylacrylate, butylacrylate, methylmethacrylate, ethylmethacrylate, dimethylmaleate, diethylmaleate, acrylonitrile, α-methylstyrene, divinylbenzene and mixtures thereof, a suspension polymerization catalyst, and a polymerization retarder which is soluble in the styrene monomer and which has a molecular weight of at least 200, said retarder being selected from the group consisting of 3,5-di-tertiary butyl-4-hydroxytoluene, 1,1-bis(4-hydroxy-phenyl) cyclohexane, 4,4′-butylidene-bis(3-methyl-6-tertiary butyl phenol), 1,3,5-trimethyl-2,4,6-tris-3,5-di-tertiary-butyl-4-hydroxybenzylbenzene, 2,2′-methylenebis (6-tertiary-butyl-4-methylphenol, dilaurylthiodipropionate, 4,4′-thiobis (3-methyl-6-tertiary-butylphenol), N,N′-di-β-naphthyl-p-phenylenediamine, and N-phenyl-N-isopropyl-p-phenylenediamine in an amount of 1/100 to 1/25 mol per mol of said suspension polymerization catalyst to conduct the polymerization of said styrenic monomer while absorbed in said polymer particles, whereby the size of said polymer particles is increased, said polymerization retarder retarding the polymerization of said styrenic monomer droplets until said styrenic monomer is absorbed by said polymer particles, the amount of said polymer and said monomer used as raw material being 5 to 60 weight % and 95 to 40 weight %, respectively, of the polymer particles produced, to thereby obtain sytrenic polymer particles having a uniform particle size of 0.6 to 3 mm.

4,085,170
METHOD AND APPARATUS FOR INCREASING CONTACT AREA IN A MULTI-PHASE SYSTEM

David Preston Simpson, and James Lawton, both of Chester, England, assignors to The Electricity Council, England

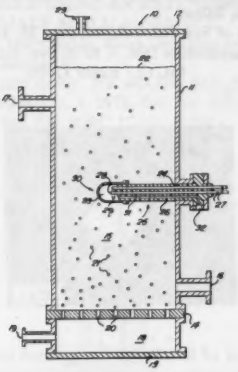
Filed Apr. 9, 1976, Ser. No. 675,415

Claims priority, application United Kingdom, Apr. 17, 1975, 15897/75

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—1 **11 Claims**

1. A method of increasing contact area of bubbles of a gaseous phase of a multi-phase system dispersed in a liquid phase of the system, comprising the steps of introducing the gaseous phase into said liquid phase and bubbling said gaseous phase dispersed in said liquid phase, providing a volume of liquid and separating said volume of liquid from said liquid phase by an acoustically transmissive membrane, subjecting said liquid phase containing said bubbles of said gaseous phase to a shock



wave for breaking up said bubbles by effecting in said separate liquid at least one electrical spark discharge.

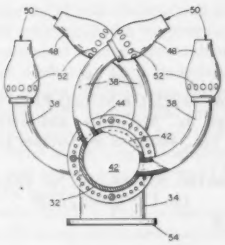
4,085,171
SPRAY COOLING SYSTEM

Donald B. Baker, Foxboro, and William E. Sparko, Westwood, both of Mass., assignors to Bird Machine Company, Inc., South Walpole, Mass.

Continuation-in-part of Ser. No. 643,337, Dec. 22, 1975, abandoned. This application May 17, 1977, Ser. No. 797,699

Int. Cl.[2] B01F *3/04;* **B05B** *1/04*

U.S. Cl. 261—36 R **19 Claims**



1. In a system for cooling large quantities of heated water which includes piping connected to a plurality of spray forming means for discharging water therefrom as spaced sprays, pumping means for pumping heated water from a source thereof through said piping to said spray forming means, a receiver for collecting the sprayed water and an outlet for cooled water from said receiver;

the improvement wherein each said spray forming means consists of a plurality of associated nozzles connected to said piping, each associated nozzle having the capacity to discharge water therefrom at a flow rate of at least 500 gallons per minute in a coherent stream having a cross-sectional area of at least 2 square inches and a minimum cross-sectional dimension of one inch, and each associated nozzle arranged so that the stream ejected therefrom simultaneously impinges upon the stream ejected by each other nozzle associated therewith in a common zone beyond said nozzles before the stream has substantially dissociated with a force which breaks the streams into a spray of drops having a resultant arched trajectory proceeding away from said associated nozzles at an angle between vertical and horizontal and terminating in said receiver.

4,085,172

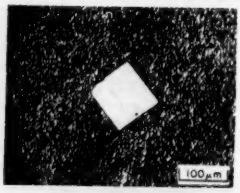
HIGH STRENGTH HALIDES

Barry G. Koepke, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 445,394, Feb. 25, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,264

Int. Cl.[2] B29D *11/00*

U.S. Cl. 264—1 3 Claims



1. A method of forming a fine-grained polygonized alkali halide body consisting substantially of potassium chloride, the method comprising:

hot working an alkali halide body consisting substantially of potassium chloride to form a fine-grained polygonized body having a grain size less than 100 microns; and

annealing the fine-grained polygonized body at a temperature of at least about 300° C for a time sufficient to remove a driving force of room temperature grain growth in the fine-grained polygonized body.

4,085,173

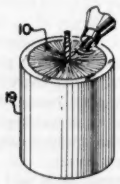
MANUFACTURE OF SOLID PROPELLANT

George F. Lomax, Jr., McGregor, and Arthur A. Coleman, Waco, both of Tex., assignors to Hercules Incorporated, Wilmington, Del.

Filed Oct. 5, 1964, Ser. No. 402,067

Int. Cl.[2] C06B *21/00*

U.S. Cl. 264—3 R 4 Claims



1. A method manufacturing solid propellant grains comprising:

providing an elongated center core,

disposing metal filaments radially extending therefrom,

inserting said core and filaments in a porous cylinder having a diameter less than that of said core and filaments, whereby said filaments protrude through said cylinder,

bonding said protruding ends of said filaments to said porous cylinder,

casting a solid propellant matrix between said porous cylinder and said core

and curing said propellant matrix.

4,085,174

PROCESS FOR SPINNING MODIFIED SYNTHETIC FIBERS

Tatsuo Ishikawa; Keiji Yamashita; Norio Okubo; Masahira Sakashita; Arimichi Okamoto, and Tetsuhiro Kusunose, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 494,255, Aug. 2, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,027

Claims priority, application Japan, Dec. 24, 1970, 45-116657; Dec. 24, 1970, 45-116658

Int. Cl.[2] B29H *7/20*

U.S. Cl. 264—49 5 Claims

1. A method of making an indefinite length synthetic fiber having extreme irregular undulations on its outer surface which vary in cross-section along the entire length of the fiber comprising the steps of:

(a) extruding a first material through a first set of passageways in a spinneret into a distributing space, wherein the first material is selected from the group consisting of polyamide, polyester, polyolefine, polyvinylchloride and polyacrylonitrile,

(b) extruding a second material through a second set of passageways in said spinneret into said distributing space, wherein the second material is different from said first material and is selected from the group consisting of polyamide, polyester, polyolefine, polyvinylchloride and polyacrylonitrile,

(c) placing said second material concentrically about said first material in said distributing space as said first material exits said first set of passageways,

(d) forming extreme, irregular undulations at the interface between the first and second material, by passing the combined first and second material through a turbulence zone, said undulations varying in cross-section along the entire axial length of the material,

(e) extruding the combined first and second material through an orifice, and

(f) removing said second material from said first material, leaving said first material in fiber form having extreme, irregular undulations along its entire outer suface.

4,085,175

PROCESS FOR PRODUCING A BALANCED NONWOVEN FIBROUS NETWORK BY RADIAL EXTRUSION AND FIBRILLATION

Herbert W. Keuchel, Tallmadge, Ohio assignor to PNC Corporation, Wycoff, N.J.

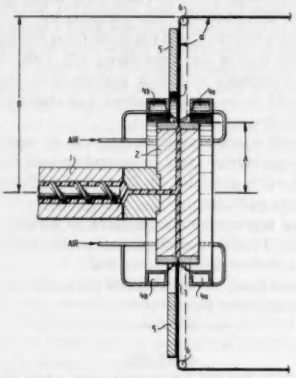
Continuation of Ser. No. 500,108, Aug. 23, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,093

Int. Cl.[2] B29D *7/02, 7/24, 27/00*

U.S. Cl. 264—51 4 Claims

1. A process for producing a nonwoven fibrous network comprising extruding a mixture of a molten thermoplastic polymer and a foaming agent radially under compression through a circular die having a die gap substantially transverse to the axis of the die head, applying radial stress to said molten thermoplastic polymer to attenuate said molten thermoplastic polymer to form a molten fibrous cellular extrudate, maintaining radial stress over the entire molten fibrous extrudate to

further attenuate said fibrous extrudate, quenching said extrudate to a temperature below its melting or flow temperature and



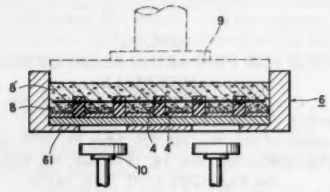
further radially stretching said extrudate to provide a balanced nonwoven fibrous network.

4,085,176

METHOD OF MANUFACTURING NON-SLIP PAVEMENT BLOCKS

Fukuzo Nakayama, Hyogo, Japan, assignor to Japan Non-Slip Pavement Co., Inc., Japan

Division of Ser. No. 281,767, Aug. 18, 1972, Pat. No. 3,832,078. This application Mar. 4, 1974, Ser. No. 448,032
Int. Cl.² B28B *1/16, 3/00*
U.S. Cl. 264—82 **4 Claims**



1. A method for producing non-slip pavement blocks, comprising:

(a) providing a plate of predetermined thickness containing a plurality of perforations therein;

(b) placing the perforated plate on a base plate of a mold comprised of side frame elements forming an enclosure with one end thereof covered by said base plate;

(c) inserting projection elements in the perforations and against the base plate such that said elements extend above the surface of said perforated plate, said projection elements being disposed on a wire net in a pattern corresponding to the perforations in the plate;

(d) introducing a mixture capable of solidificaton through the open end of said mold frame over, around and covering the exposed portions of the projections and the perforated plate;

(e) compressing the ingredients in the mold against the base plate, and allowing solidification;

(f) removing from the mold frame the compacted solidified ingredients as a unit along with the base plate;

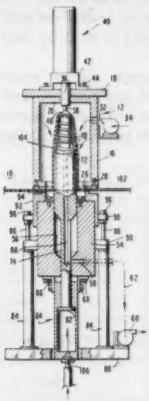
(g) removing the base plate and stripping the perforated plate from the solidified ingredients by peeling it away.

4,085,177

PROCESS FOR THERMOFORMING A HOLLOW PLASTIC ARTICLE USING AN EXTENDIBLE POROUS MALE MOLD ASSEMBLY

Donald G. Sauer, Harwington, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 469,404, May 13, 1974. This application Jun. 3, 1975, Ser. No. 583,427
Int. Cl.² B29C *17/03, 17/04*
U.S. Cl. 264—89 **3 Claims**



1. In a process for thermoforming a hollow plastic article of uniform thickness over a male mold passed through a plane of a heated sheet of thermoplastic retained between a pressure box assembly including a chamber and a male mold assembly including said male mold and wherein said article is vacuum formed about said male mold, the improvement comprising:

moving said male mold assembly towards said pressure box assembly and continuing such movement whereby said male mold is passed through said plane of said heated sheet of thermoplastic material and into said chamber of said pressure box assembly, said male mold formed in part of a porous metal and having a contoured surface corresponding to said article, said male mold being extendible from said male mold assembly;

placing said male mold in fluid communication with the suction side of a pump means and controlling the pressure within said chamber whereby said thermoplastic material is caused to be drawn about said male mold; and

causing said male mold to move further into said chamber of said pressure box assembly by extendible relative movement of said male mold with respect to said male mold assembly while maintaining said male mold in fluid communication with said suction side of said pump and said controlling of the pressure within said chamber, said extendible relative movement being effected to a point beyond further relative movement between said pressure box assembly and said male mold assembly.

4,085,178

METHOD FOR PRODUCING INJECTION MOLDED AND CENTRALLY APERTURED DISC RECORDS

Michael Lee McNeely, Indianapolis, Ind., and Herbert Rees, Willowdale, Canada, assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 642,162, Dec. 18, 1975, Pat. No. 3,989,436. This application Jun. 9, 1976, Ser. No. 694,440
Int. Cl.² B29D *17/00*
U.S. Cl. 264—106 **2 Claims**

1. A method for forming a disc record having an annular recorded region surrounding a centering aperture therein; said method comprising the steps of:

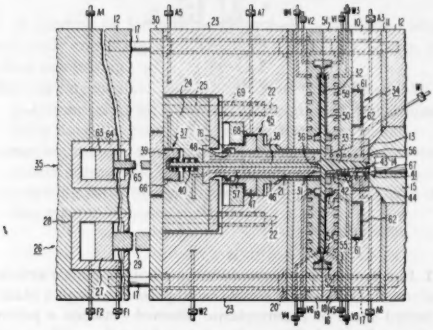
(A) injecting heated material into an annular cavity defined by a pair of mold halves through a sprue passage located at the center of said annular cavity and defined by a sprue bushing and an end portion of a punch; and said annular cavity and said sprue passage forming, respectively, said centrally apertured record and a sprue;

(B) locking said punch in place while said annular cavity is displaced relative to said sprue passage so that said sprue is severed from said record along the peripheral surface of said punch end portion;

(C) separating said mold halves to open said annular cavity while said sprue is resting on said punch end portion and while said record is held by said punch end peripheral surface;

(D) actuating a sprue ejector member to eject said sprue from said punch end portion; and

(E) actuating a record ejector member to eject said record from said punch peripheral surface.



2. A method for forming a disc record having an annular recorded region surrounding a centering aperture therein; said method comprising the steps of:

(A) injecting heated material into an annular cavity defined by a pair of mold halves through a sprue passage located at the center of said annular cavity and defined by a sprue bushing and an end portion of a punch; and said annular cavity and said sprue passage forming, respectively, said centrally apertured record and a sprue;

(B) locking said punch in place while said annular cavity is displaced relative to said sprue passage so that said sprue is severed from said record along the peripheral surface of said punch end portion;

(C) separating said mold halves to open said annular cavity while said sprue is resting in said sprue bushing and while said record is held by said punch end peripheral surface;

(D) actuating a sprue ejector member to eject said sprue from said sprue bushing; and

(E) actuating a record ejector member to eject said record from said punch peripheral surface.

4,085,179

PROCESS FOR PREPARING DRY MIX BRAKE LINING

Mial T. Hillhouse, Canton, and Richard L. Ramsey, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 515,960, Oct. 18, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,359

Int. Cl.[2] B29C *3/00*

U.S. Cl. 264—122 **2 Claims**

1. In a dry mix process for forming an organic brake lining, comprising:

(A) blending a mixture of dry finely divided phenolic resin particles with dry particulate brake lining friction materials and

(B) molding and curing the resulting blend at a temperature in the range of about 275° to about 325° F. and at a pressure of about 250 to about 50,000 psi to bond the resin and friction particles into a unitary brake lining, the improvement comprising, prior to step (A), forming a rubber coating on said phenolic resin particles by

(1) forming a slurry of said phenolic resin particles having a particle size of less than about 325 Tyler mesh with water containing sufficient sulfuric acid and alum to have a pH in the range of about 4 to about 6 at the end of the following step (2),

(2) mixing said aqueous resin slurry with an aqueous styrene/butadiene rubber latex to coagulate said rubber latex onto said resin particles to form finely divided rubber coated resin particles,

(3) adding styrene/butadiene resin to further coat said coagulated rubber coated phenolic resin particles and to prevent surface tack thereon, and

(4) drying said finely divided coated phenolic resin particles for use in said step (A).

4,085,180

METHOD FOR RIGID ENCLOSURES AND MOLDED ITEMS

Donald G. Stoffey, P.O. Box 1610, Salinas, Calif. 93901

Continuation-in-part of Ser. No. 323,421, Jan. 19, 1973, Pat. No. 3,955,566, which is a continuation-in-part of Ser. No. 318,201, Jan. 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 224,220, Feb. 7, 1972, abandoned. This application Dec. 16, 1975, Ser. No. 641,227

Int. Cl.[2] B29G *5/00*

U.S. Cl. 264—128 **19 Claims**

1. A method for preparing molded articles comprising the steps:

a. Filling the mold of the article to be molded with a free-radical catalyst impregnated and dried solid substrate;

b. adding to said solid substrate in said mold an activated thermosetting vinyl resin activated with a tertiary aromatic amine;

c. allowing said solid substrate to harden in said mold.

4,085,181

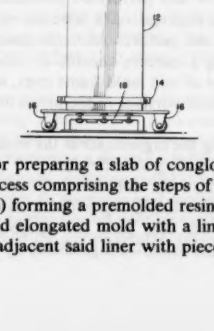
PROCESS FOR PREPARING SLABS OF BUILDING MATERIALS

Edward A. Cosentino, 2100 S. Ocean La., Apt. No. 1707, Fort Lauderdale, Fla. 33316

Continuation of Ser. No. 145,725, May 21, 1971, abandoned. This application Nov. 14, 1974, Ser. No. 523,702

Int. Cl.[2] B29D *3/00, 7/18, 23/08*

U.S. Cl. 264—158 **7 Claims**



1. A process for preparing a slab of conglomerate building material, said process comprising the steps of (a) providing an elogated mold; (b) forming a premolded resin liner on at least one surface of said elongated mold with a lining material; (c) filling said mold adjacent said liner with pieces of solid mate-

rial to form an aggregate of individual pieces with interstices therebetween; (d) filling said interstices with bonding material which chemically bonds to the liner and also bonds to the filling material; (e) causing said bonding material to cure and harden to form a lined composite consisting of matrix of hardened bonding material which is sufficiently elongated to permit a plurality of slabs to be cut transversely from said matrix, said matrix having embedded therein peices of solid material, at least one surface of said matrix being lined with and chemically bonded to said liner so that said liner forms an elongated outer surface of said matrix which is not removed from said matrix or otherwise altered when said matrix is cut transversely to the elongated surface of the liner to produce a slab of building material; (f) removing the resulting lined composite from said mold; (g) cutting said elongated matrix and said liner transversely to said elongated surface to form a slab of building material having at least one outer edge surface which is not chipped or otherwise scarred, which has precise dimensions and which edge surface comprised a portion of the outer surface of the liner before the slab was cut; and (h) repeating said cutting step at least once to produce a plurality of said slabs from a single elongated matrix.

4,085,182

PROCESS FOR PRODUCING ELECTRICALLY CONDUCTIVE SYNTHETIC FIBERS

Sumio Kato, Mihara, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Oct. 8, 1975, Ser. No. 620,851
Claims priority, application Japan, Oct. 9, 1974, 49-115602
Int. Cl.[2] B29F *3/10*; D01D *5/12*
U.S. Cl. 264—171 **8 Claims**

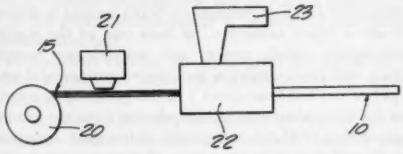
1. A process for producing sheath-core type electrically conductive synthetic composite filaments, which comprises simultaneously melt-extruding from a spinneret, in a sheath-core filament configuration, an electrically conductive core composition of polycapramide containing an electrically conductive carbon black dispersed therein, and a non-conductive sheath composition of polycapramide and taking up the extruded sheath-core type synthetic filaments at a take-up speed of at least 2,500 meters per minute, with the proviso that said process is carried out without a separate drawing step.

4,085,183

METHOD OF MAKING A STRAIN MEMBER FOR USE IN AN ELECTROMECHANICAL CABLE

Norman P. Roe, Idyllwild, Calif., assignor to Consolidated Products Corporation, Idyllwild, Calif.

Division of Ser. No. 574,611, May 5, 1975, Pat. No. 3,973,385. This application May 3, 1976, Ser. No. 682,856
Int. Cl.[2] B29F *3/10*; H01B *7/18*
U.S. Cl. 264—174 **2 Claims**



1. The method of making a strain member for use in an electromechanical cable, comprising the steps of:

selecting a plurality of elongated flexible yarns having high tensile strength and placing them in non-adhering side-by-side relationship to form a bundle having a generally circular cross-sectional configuration;

extruding a generally cylindrical jacket of deformable non-adhering plastic material around said bundle of yarns, and

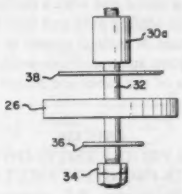
passing the jacket with bundle of yarns contained therein through a forming die so as to reform the composite strain member to a generally rectangular cross-sectional configuration.

4,085,184

METHOD FOR PRODUCING PACKING RINGS FOR FLUID SYSTEMS AND THE LIKE

Samuel Edward Jules, 1039 Pennsylvania Ave., RD #5, Harrisburg, Pa. 17111, and John James McGarry, Sr., 1019 Clearview Dr., Middletown, Pa. 17057

Filed Jan. 20, 1976, Ser. No. 650,798
Int. Cl.[2] B29C *1/02*
U.S. Cl. 264—219 **6 Claims**



1. A method for molding annular members, such as packing rings, from a wide range of materials and in a wide number of sizes with the same mold parts being used for all sizes, said method comprising the steps of:

forming a continuous array of a plurality of closely intermating concentric cylindrical members;

dividing said plurality of concentric cylindrical members into any one of a wide range of three different sized intermating groups defining a core and an annular housing equal in size to the inner and outer diameters respectively of the annular member to be formed and an annular ram formed by the remaining intermediate cylindrical members;

mounting the core forming members on an axial pin in a base plate;

placing said annular housing forming members on said base plate spaced said core to define an annular cavity therebetween;

placing packing ring material into said annular cavity;

placing said annular ram forming members into said cavity;

placing a header plate on said pin and against said ram forming members; and

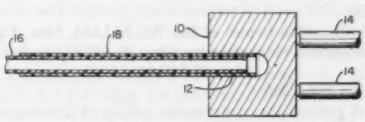
applying compressive force to drive said plates together whereby said packing material in said annular cavity is compressed into an annular packing ring.

4,085,185

METHOD OF SEALING CONCENTRIC TUBE ENDS TO MAKE SEALED DUAL-WALL TUBE

Edwin L. Adair, 5985 S. Crocker St., Littleton, Colo. 80120

Division of Ser. No. 564,775, Apr. 3, 1975, abandoned. This application Jul. 23, 1976, Ser. No. 708,064
Int. Cl.[2] B29C *11/00, 27/00*; B29F *1/00*
U.S. Cl. 264—248 **15 Claims**



1. A method for sealing together the ends of at least two different diameter tubes made of thermoplastic materials heat-sealable together to form a multiple-walled tube which comprises:

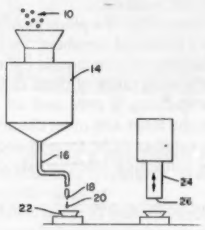
(a) arranging the tubes concentrically with the ends to be sealed near each other, the end of one tube being positioned to extend beyond the end of the other tube;
(b) positioning a rod having good heat conductivity and a higher melting point than the plastic of the tubes inside the inner tube with its one end spaced slightly axially inwardly of the end of said other tube to form an assembly of ends of said inner and outer tubes and rod;
(c) placing said ends in a mold cavity having a surface conforming substantially to a desired outer surface of the sealed tube ends; and
(d) heating said tube ends to a temperature sufficient to at least soften the plastic of the extended tube and seal the tube ends together, and shaping said plastic against the heat-conducting metal rod which facilitates conduction of heat through the sealing area and forms a dam to hold the maximum amount of melted plastic in the sealing area to make a strong joint and a multiple-walled tube is formed in which the ends of the tubes are sealed together.

4,085,186

PROCESS FOR PRODUCING FLOW-IN CLOSURE SEALING GASKETS FROM HOT MELT COMPOSITIONS

William C. Rainer, Barrington, R.I., assignor to CPL Corporation, E. Providence, R.I.

Filed Dec. 5, 1975, Ser. No. 637,851
Int. Cl.[2] B29C *13/02*
U.S. Cl. 264—268 **7 Claims**



1. Process for producing a gasket in a closure to thereby render the closure capable of sealing a container, said process being characterized by the steps of:
(a) providing a vinyl chloride free, elastomeric hot melt composition having a viscosity index less than about 40 meter-grams torque at 175° C and being capable of retaining a given shape when cooled;
(b) heating the composition to cause it to flow;
(c) depositing a metered amount of the flowable, heated composition from a nozzle into a closure shell;
(d) shaping the composition in the closure shell to form a gasket; and
(e) cooling the shaped gasket.

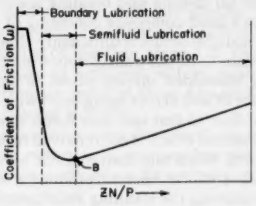
4,085,187

PROCESS FOR COMPRESSION ROLLING OF POLYMERIC FILMS

Richard H. Jenks, Saquoit, N.Y., and Egbert M. Kipp, Devon, Pa., assignors to Revere Copper and Brass, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 562,651, Mar. 27, 1975, abandoned. This application May 10, 1976, Ser. No. 684,970
Int. Cl.[2] B29C *15/00*
U.S. Cl. 264—280 **8 Claims**

1. A process for compression rolling of thermoplastic sheet material comprising:
(a) passing the material between cylindrical rollers under semi-boundary or boundary lubrication conditions to effect a reduction in the original thickness of the material of between about 5 and 95 percent in a single pass;
(b) maintaining the circumferential speed of the rollers in step (a) essentially equal to the linear speed of the thermoplastic sheet material passing between said rollers; and



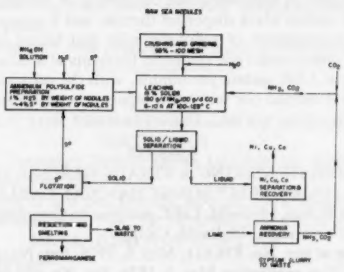
(c) maintaining the film rewind tension in the vicinity of the elastic limit of the material exiting from the rollers.

4,085,188

REDUCTION LEACHING OF RAW SEA NODULES WITH SULFIDES

Kohur Nagaraja Subramanian, Mississauga, and Gerald Vernon Glaum, Oakville, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,752
Claims priority, application Canada, Mar. 24, 1975, 222914; Mar. 4, 1976, 247157
Int. Cl.[2] C01G *3/14, 51/12, 53/12*
U.S. Cl. 423—32 **11 Claims**

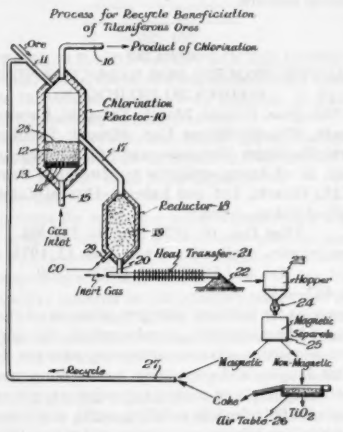


1. A process for extracting nickel, cobalt, copper and molybdenum values from raw sea nodules containing a major amount of manganese and iron, manganese being present in tetravalent state and a lesser amount of at least one of the nonferrous metals nickel, cobalt, copper and molybdenum comprising leaching said raw nodules in an aqueous ammoniacal medium at a pH of not less than about 8 in the presence of a reducing agent for tetravalent manganese selected from the group consisting of H_2S, $(NH_4)_2S$, ammonium polysulfide, and combinations thereof and in the presence of a manganous carbonate precipitant selected from the group consisting of CO_2, $(NH_4)_2CO_3$, and an alkali metal carbonate, at a temperature in the range of about 50° C to about 125° C and pressure of atmospheric to about 100 psig, to convert tetravalent manganese to the divalent state, extract nickel, cobalt, copper and molybdenum values into the leach solution and to separate manganese and iron values into the leach residue, said leaching reaction condition being maintained for a period of time sufficient to maximize said extraction of nickel, cobalt, copper and molybdenum values into solution and separation of manganese and iron values into the leach residue.

4,085,189
PROCESS FOR RECYCLE BENEFICIATION OF TITANIFEROUS ORES

Wendell E. Dunn, Jr., Star Route 68D, Spearfish Canyon, S. Dak. 57733

Continuation-in-part of Ser. No. 4,563, Jan. 21, 1970, abandoned, and Ser. No. 267,519, Jun. 29, 1972, abandoned. This application May 21, 1976, Ser. No. 688,719
Int. Cl.[2] C01G *23/04, 49/10*
U.S. Cl. 423—74 4 Claims



1. A continuous process for producing a novel titanium dioxide composition containing 95 to 98 percent, by weight, of titanium dioxide and not more than 1.5 percent, by weight, of iron oxide calculated as Fe_2O_3 from a titanium ore containing trace metals as oxides wherein said process minimizes the loss of titanium values by repressing the amount of titanium tetrachloride produced, comprising:

(a) continuously reacting, at elevated temperatures with a member selected from the group consisting of chlorine, chlorine mixed with a diluent gas, a mixture of chlorine and carbon monoxide and a mixture of chlorine, carbon monoxide and a diluent gas said diluent gas being selected from the group consisting of air, oxygen, carbon dioxide, nitrogen and mixtures thereof a bed of a particulate titaniferous ore in a reactor, under reducing and fluidizing conditions, to form a partially beneficiated bed of ore containing at least 5 percent, by weight, or iron oxide, calculated as Fe_2O_3, and vaporizing and withdrawing from the reactor ferrous chloride, ferric chloride, diluent gas, traces of carbon monoxide, carbon dioxide, vaporized metal chlorides, titanium tetrachloride and unreacted chlorine;

(b) continuously withdrawing a portion of the partially beneficiated bed;

(c) continuously cooling the withdrawn portion of the partially chlorinated bed under non-oxidizing or reducing conditions;

(d) continuously separating the product of step (c) into a first magnetic fraction having an iron oxide content greater than 1.5 percent, by weight, and a titanium dioxide content of less than 95 to 98 percent, by weight, and a second nonmagnetic fraction having 95 to 98 percent, by weight, of titanium dioxide and less than 1.5 percent, by weight, of iron oxide, calculated as Fe_2O_3;

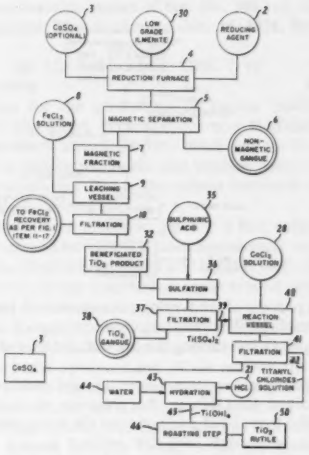
(e) continuously returning the first partially beneficiated ore mixture to the reactor mixed with sufficient fresh titaniferous ore whereby a constant bed depth is maintained and said bed contains at least 5 percent, by weight, of iron oxides, calculated as Fe_2O_3, thereby repressing the loss of titanium values by the formation of titanium tetrachloride; and

(f) continuously repeating steps (a) through (e).

4,085,190
PRODUCTION OF RUTILE FROM ILMENITE

Chyn Duog Shiah, 189 Nassau Ave., Manhasset, L. I., N.Y. 11030

Filed Apr. 29, 1975, Ser. No. 572,938
Int. Cl.[2] C01G *23/04*
U.S. Cl. 423—80 1 Claim



1. The method for the production of titanium dioxide in rutile form from ilmenite which comprises the steps of:

a. mixing ilmenite ore with calcium sulfate in a proportion of 1:10 to 10:1;

b. heating said mixture with hydrogen at temperatures in the range 1500° to 1800° F for up to 1 hour to reduce the iron in the ilmenite ore to metallic iron and the calcium sulfate to calcium sulfide;

c. magnetically separating the reduced mixture to form a magnetic fraction containing the iron and the TiO_2 content of the ores, and a non-magnetic fraction comprising the calcium sulfide and non-TiO_2 gangue, and segregating the non-magnetic fraction;

d. leaching said magnetic fraction with a ferric chloride solution thus dissolving said metallic iron and filtering the leached fraction leaving the TiO_2-components as a residue;

e. dissolving the TiO_2 residue in concentrated sulfuric acid to form a titanyl sulfate solution thereof;

f. adding at least one mole equivalent of calcium chloride solution to said titanyl sulfate solution to form a solution of titanyl chloride and a precipitate of insoluble calcium sulfate;

g. separating said insoluble calcium sulfate precipitate from said titanyl chloride solution;

h. hydrolyzing said titanyl chloride solution by the addition of water and heat, thus precipitating titanium oxide hydrate and liberating gaseous hydrochloric acid;

i. calcining said titanium oxide hydrate to form TiO_2 in rutile form;

j. recycling the liberated hydrochloric acid from (h) to react with the calcium sulfide of the non-magnetic fraction obtained at (c) to form the calcium chloride used in step (f);

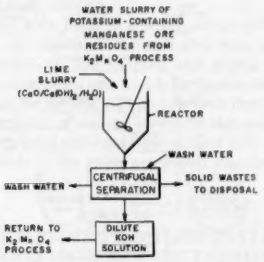
k. recycling the calcium sulfate precipitate, separated at (h), to mix with fresh ilmenite at (a);

l. oxidizing the leached iron-containing solution with an oxygen-containing gas to precipitate iron oxide (Fe_2O_3) from said solution and regenerating ferric chloride solution for use in step (d).

4,085,191
PROCESS FOR RECOVERY OF POTASSIUM FROM MANGANATE PLANT WASTES

Peter G. Mein, and Horst R. Adolf, both of Peru, Ill., assignors to Carus Corporation, LaSalle, Ill.

Filed Apr. 26, 1977, Ser. No. 791,005
Int. Cl.[2] C01D *1/04*
U.S. Cl. 423—208 **7 Claims**



1. The process of recovering potassium from potassium-containing residue solids resulting from conversion of manganese ore to K_2MnO_4 by reacting the ore with KOH and O_2, comprising:

(a) reacting an aqueous slurry of said residue solids with dissolved $Ca(OH)_2$ in the presence of undissolved $Ca(OH)_2$, from 2 to5 mols of total Ca being used per mol of K in said solids, any Na present in said solids being counted as K in determining the mols of Ca to be used;

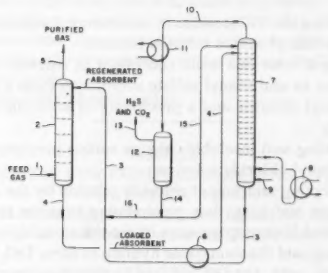
(b) continuing said reaction until at least 50% of the K in said residue solids has been solubilized as KOH while limiting the concentration of said KOH to less than 50 grams KOH per liter of water; and

(c) separating the resulting KOH solution from the reacted solids.

4,085,192
SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES

Robert W. Van Scoy, Missouri City, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 11, 1973, Ser. No. 359,564
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—226 **14 Claims**



1. A process for selectively removing hydrogen sulfide from a gaseous mixture containing hydrogen sulfide and carbon dioxide which comprises:

(a) contacting said gaseous mixture with a hydrogen sulfide-selective aqueous alkanolamine absorbent solution in an absorption column having from 3 to 20 contacting trays, said trays having an average dry tray pressure drop of from about 1.5 to about 5 inches per tray, thereby obtaining a treated gas containing less than 10% of the hydrogen sulfide present in the gaseous feed but more than 50% of the carbon dioxide present in said feed, and a hydrogen sulfide and carbon dioxide enriched-absorbent solution,

(b) passing said hydrogen sulfide and carbon dioxide-enriched absorbent solution to a regenerating zone and stripping said absorbent solution to a hydrogen sulfide content which corresponds to an equilibrium loading for a H_2S-content having less than 50% of the hydrogen sulfide content of the treated gas, and

(c) returning said regenerated absorbent liquid into contact with the hydrogen sulfide and carbon dioxide containing gaseous mixture.

4,085,193
CATALYTIC PROCESS FOR REDUCING NITROGEN OXIDES TO NITROGEN

Fumito Nakajima, Hitachi; Masato Takeuchi, Katsuta; Shimpei Matsuda, Hitachi; Shigeo Uno, Hitachi; Toshikatsu Mori, Hitachi; Yoshihisa Watanabe, and Makoto Imanari, both of Ibaragi, all of Japan, assignors to Mitsubishi Petrochemical Co. Ltd.; Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, all of Tokyo, Japan

Filed Dec. 10, 1974, Ser. No. 531,304
Claims priority, application Japan, Dec. 12, 1973, 48-137685
Int. Cl.[2] B01J *8/00; C01B 21/00*
U.S. Cl. 423—239 **9 Claims**

1. A process for reducing nitrogen oxides to nitrogen, which comprises adding ammonia, as substantially the sole reducing agent, to a gaseous mixture containing nitrogen oxides and molecular oxygen, and contacting the resulting gaseous mixture containing nitrogen oxides, molecular oxygen and ammonia, as substantially the sole reducing agent, at a temperature of 150° to 550° C. and at a space velocity of 1,000 to 100,000/hour with a catalyst composition consisting essentially of an intimate mixture of the following components in the following atomic ratios: (A) one atom of titanium (Ti) as component A, (B) 0.01 to 1 atom of at least one metal selected from the following groups B-1 and B-2 wherein group B-1 consists of iron (Fe) and vanadium (V) and group B-2 consists of molybdenum (Mo), tungsten (W), nickel (Ni), cobalt (Co), copper (Cu), chromium (Cr), and uranium (U), with the proviso that when vanadium (V) is selected from group B-1, at least one of molybdenum (Mo) and tungsten (W) from group B-2 is also present in the catalyst composition, and optionally (C) tin (Sn) as component C, and (D) at least one metal as component D selected from the group consisting of silver (Ag), beryllium (Be), magnesium (Mg), zinc (Zn), boron (B), aluminum (Al), yttrium (Y), rare earth elements, silicon (Si), niobium (Nb), antimony (Sb), bismuth (Bi), and manganese (n), wherein when said catalyst composition includes optional component C, it is present in an atomic ratio of component A to component C of 1:003 - 0.2 and said optional component D being present at an atomic ratio of component A to component D of 1:0 - 0.15, said elements of component A, B-2, C and D being contained in said catalyst in the form of oxides, and the iron and vanadium of component B-1 being contained in said catalyst in the form of oxides and/or sulfates.

4,085,194
WASTE FLUE GAS DESULFURIZING METHOD

Kouji Otani; Toshio Sawa; Osamu Kuroda; Fumito Nakajima, all of Hitachi, Japan, and Tokuji Iijima, deceased, late of Hitachi, Japan (by Yoshie Iijima, administratrix), assignors to Hitachi, Ltd., Japan

Filed Apr. 27, 1973, Ser. No. 355,272
Claims priority, application Japan, May 8, 1972, 47-45209/72
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—242 **20 Claims**

1. A method of desulfurizing waste flue gases, comprising contacting waste flue gas containing sulfurous acid gas directly with sea-water containing metal ions and HCO_3^- thereby absorbing the sulfurous acid gas in the sea-water and concurrently forming metal sulfites in the sea-water by the reaction

between sulfite ions formed during said absorption and metal ions present in the sea-water, contacting the metal sulfite containing sea-water with an oxygen containing gas to effect decarbonation of said sea-water which is then in the acidic region thereby to restore the pH value of the sea-water to the neutral region, said contacting of the sea-water with the oxygen containing gas also serving to convert the sulfites into sulfates, and said sea-water being in an amount such that the quantity of the sulfurous acid gas absorbed in the sea-water is substantially less than the total alkaline equivalent of said sea-water.

4,085,195

SORBENT PREPARATION AND PROCESS USING SAME

Neville L. Cull, Baker; Lloyd A. Pine, Baton Rouge, both of La., and Dale D. Maness, Austin, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 291,908, Sep. 25, 1972, Pat. No. 3,985,682. This application Jun. 5, 1974, Ser. No. 476,669

Int. Cl.[2] B01J *8/00*; C01B *17/00*

U.S. Cl. 423—244 **7 Claims**

1. In a process for removing sulfur dioxide from a gaseous mixture containing the same wherein said gaseous mixture is contacted with a sorbent under desulfurizing conditions, said sorbent comprising a porous, solid inorganic hydrophilic carrier and an active material for the selective removal of SO_2, the improvement wherein said active material is deposited predominantly in an outer zone adjacent to the external surface of said carrier and wherein said sorbent is prepared by:

a. immersing the porous solid inorganic hydrophilic carrier material in a polar organic presoak liquid such that said presoak liquid substantially completely fills the pores of the carrier material, said presoak liquid being capable of (1) wetting said carrier material and (2) displacement by the impregnating solution used in (b) at a rate slow enough to permit control of the depth of impregnation; and

b. separating the carrier material from the presoak liquid and, without substantial removal of presoak liquid from the pores of said carrier material, immersing the separated carrier material in an impregating solution containing a compound which is decomposable into the desired active material for a time sufficient to permit the impregnating solution to displace a portion of the presoak liquid and thereby penetrate the carrier material to a controlled depth, the depth of penetration being controlled by the time during which said separated carrier material is immersed in said impregnating solution at any given set of impregnating conditions.

4,085,196

PROCESS FOR PRODUCING SYNTHETIC DIAMONDS

Vladimir Ivanovich Farafontov, Dibuny, ulitsa Kljucheva, 69, kv. 4, Leningrad; Yaroslav Alexeevich Kalashnikov, Starokonjushenny pereulok, 39, kv. 5, Moscow; Jury Nikolaevich Novikov, ulitsa Petra Romanova, 15, kv. 19, Moscow; Mark Efimovich Volpin, ulitsa Vavilova, 48, kv. 412, Moscow; Leonid Fedorovich Vereschagin, Kutuzovsky prospekt, 2/1, kv. 231, Moscow, and Vladislav Sergeevich Lysanov, prospekt Vavilova, 8, korpus 1, kv. 422, Leningrad, all of U.S.S.R.

Filed Feb. 28, 1977, Ser. No. 772,474

Claims priority, application U.S.S.R., Mar. 1, 1976, 2323002(I)

Int. Cl.[2] C01B *31/06*

U.S. Cl. 423—446 **11 Claims**

1. A process for producing synthetic diamonds which comprises subjecting a charge consisting of graphite or a carbonaceous material capable of being graphitized and a catalyst consisting of at least one laminar compound of at least one transition metal with graphite in which said metal in said laminar compound is interposed between the carbon layers of the graphite and chemically bonded therewith to a pressure and temperature and for a time sufficient to convert the non-chemically bonded graphite of said charge to diamond, said laminar compound remaining stable at said pressure and temperature, whereby rapid conversion is effected.

4,085,197

CARBON BLACK PROCESS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 464,953, Apr. 29, 1974, Pat. No. 3,986,836, which is a continuation-in-part of Ser. No. 285,115, Aug. 31, 1972, abandoned. This application Jun. 24, 1976, Ser. No. 699,732

Int. Cl.[2] C01B *31/02*; C09C *1/48*

U.S. Cl. 423—450 **6 Claims**

1. A process for the production of carbon black by the pyrolytic decomposition of a hydrocarbon feedstock in an essentially tubularly shaped carbon black reactor having an upstream and a downstream end, said process comprising:

a. axially introducing said hydrocarbon feedstock into said carbon black reactor,

b. introducing hot combustion gases at a first velocity into said reactor and moving the gases in a circular movement around the longitudinal axis of said reactor such as to form a first vortex of hot combustion gases around said axially introduced feedstock,

c. introducing a gas at a second velocity into said reactor at a location between the location of creation of said first vortex and said upstream end of the reactor and moving the gas in a circular movement around the longitudinal axis of said reactor such as to create a second vortex of gases having the same directional sense as said first vortex,

aa. said second velocity being, however, considerably higher than said first velocity, and

bb. the external diameter of said first vortex being, however, larger than the external diameter of said second vortex,

d. pyrolytically decomposing said hydrocarbon feedstock in the hot combustion gases to form a carbon black containing-smoke, and

e. withdrawing said carbon black containing-smoke from said reactor.

4,085,198

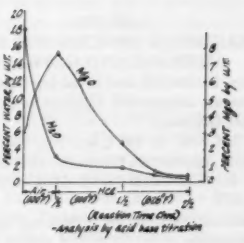
HYDROCHLORINATION OF SPRAY DRIED MAGNESIUM CHLORIDE

Modesto Erneta, Princeton Junction, N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,428

Int. Cl.[2] C01F *5/34*

U.S. Cl. 423—498 **1 Claim**



1. Process for treating spray dried magnesium chloride solids having a bulk density in the range of from about 11 to about 18 pounds per cubic foot and containing about 12 to 18 weight percent water and from about 3 to 5 weight percent magnesium oxide comprising, heating said solids in the presence of a dry gas selected from the group consisting of air and combustion gases in the range from about 500° to 800° F for a period of about one half hour, subsequently hydrochlorinating such heated solids with preheated dry hydrogen chloride gas heated

to a temperature in the range of from about 550° to 700° F, thereby to produce a substantially anhydrous magnesium chloride feed material having a magnesium oxide content of no more than about 0.6 weight percent.

4,085,199

METHOD FOR REMOVING HYDROGEN SULFIDE FROM SULFUR-BEARING INDUSTRIAL GASES WITH CLAUS-TYPE REACTORS

Alan H. Singleton, Baden; Otto A. Homberg, Easton, and Charles W. Sheldrake, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jun. 8, 1976, Ser. No. 694,001
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—574 R **15 Claims**

1. In a method of desulfurizing a hydrogen sulfide and hydrogen containing fuel gas without exhausting any sulfur containing tail gas including:

(a) contacting a hydrogen sulfide and hydrogen containing feed fuel gas with an absorbing solution to absorb substantially all hydrogen sulfide from said feed fuel gas and generate a substantially desulfurized fuel gas,

(b) desorbing said hydrogen sulfide from said absorbing solution and passing said desorbed hydrogen sulfide to a Claus reaction zone together with an approximately stoichiometric amount of sulfur dioxide based upon the amount of hydrogen sulfide which is to be reacted with sulfur dioxide in said reaction zone to form elemental sulfur and water leaving a tail gas with sulfur components,

the improvement comprising:

(c) conducting a portion of a fuel gas of step (a) to a catalytic hydrogenation zone in a quantity sufficient to provide at least an amount of hydrogen to stoichiometrically react with any sulfur dioxide, carbonyl sulfide, carbon disulfide and elemental sulfur vapors contained in the tail gas from step (b),

(d) conducting the tail gas from the reaction of sulfur dioxide with hydrogen sulfide in step (b) to the catalytic hydrogenation zone of step (c) and reacting sulfur dioxide, carbonyl sulfide, carbon disulfide and elemental sulfur vapors in said tail gas with the hydrogen in said fuel gas to form hydrogen sulfide plus additional amounts where appropriate of methane and water and form a hydrogenated tail gas, and

(e) recycling said hydrogenated tail gas with no substantial sulfur content in a form other than hydrogen sulfide to contact said absorbing solution of step (a) simultaneously with said hydrogen sulfide and hydrogen containing feed fuel gas.

4,085,200

THERMOCHEMICAL PROCESS FOR PRODUCING METHANE AND OXYGEN

Rudolf Schulten, Richterich, and Friedrich Behr, Gross Denkte, both of Germany, assignors to Rheinische Braunkohlenwerke AG., Cologne, Germany

Filed Feb. 15, 1977, Ser. No. 768,701
Claims priority, application Germany, Feb. 20, 1976, 2606886
Int. Cl.[2] C01B *13/02*; C07C *9/04*
U.S. Cl. 423—579 **16 Claims**

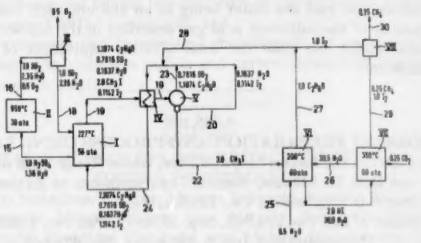
1. A recirculatory process for producing methane and oxygen which comprises:

a. reacting iodine and an oxide in a lower valency stage with a reactant selected from the group consisting of methanol, dimethylether and a mixture of methanol and dimethylether at an elevated temperature to form the corresponding oxide having a higher valency stage and methyl iodide;

b. hydrolysing the so formed methyl iodide to form hydrogen iodide and re-form the dimethylether and/or methanol;

c. reacting the so formed hydrogen iodide with carbon dioxide to form methane and re-form iodine and water;

d. decomposing the oxide in a higher valence stage into the corresponding oxide in a lower valence stage and releasing oxygen,



and in which the oxygen released in (d) and the methane formed in (c) are removed from the system whilst the remaining components are re-utilised in reactions (a) to (d).

4,085,201

PROCESS FOR MANUFACTURING ALUMINUM OXIDE

Kenneth F. Griffiths, 21 N. Chatsworth Ave., Larchmont, N.Y. 10538

Continuation of Ser. No. 441,129, Feb. 11, 1974, abandoned.
This application Jun. 28, 1976, Ser. No. 700,116
Int. Cl.[2] C01F *7/32*
U.S. Cl. 423—625 **8 Claims**

1. A method of producing aluminum oxide powder of substantially uniform particle size from aluminum sulfate comprising

1. first thermally treating said aluminum sulfate at a temperature in the range from about 800° to about 1150° C.

2. maintaining said temperature for a time sufficient to decompose all of said aluminum sulfate and to form a mass of aluminum oxide having a uniform temperature throughout, and

3. thereafter subjecting said uniformly heated mass of aluminum oxide to additional heat to raise its temperature uniformly at approximately the same rate as the heat source to a curing temperature in the range from about 1175° to about 1250° C. for an additional period of time sufficient to cure said aluminum oxide and to increase the average particle size of aluminum oxide.

4,085,202

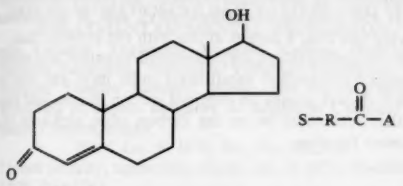
TESTOSTERONE DERIVATIVES

Pemmaraju Narasimha Rao, San Antonio, Tex., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Division of Ser. No. 615,812, Sep. 22, 1975, Pat. No. 4,031,117.
This application Sep. 29, 1976, Ser. No. 727,409
Int. Cl.[2] G01N *33/16*; A61K *39/00*
U.S. Cl. 424—1 **19 Claims**

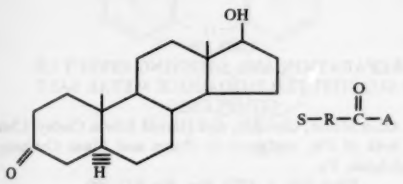
1. An immunogen comprising:

an immunological carrier having conjugated thereto by a chemical coupling agent a compound selected from the group consisting of compounds represented by the formula:



(a)

wherein R is an alkyl group of from 1 to 6 carbon atoms A is selected from the group consisting of —OH, —OM wherein M is an alkali metal barium, calcium, or strontium, and OY wherein Y is an alkyl group of from 1 to 6 carbon atoms; and



(b)

wherein R and A are as defined above.

4,085,203

PROCESS FOR PREPARING VACCINE

Ronald Charles Telling, Woking; Roy John Passingham, Fleet; Brian Lewis Kitchener, and David George Hopkinson, both of Farnborough, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 354,195, Apr. 25, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,448

Claims priority, application United Kingdom, Apr. 26, 1972, 19387/72

Int. Cl.[2] A61K *39/12;* C12K *9/00*

U.S. Cl. 424—89 6 Claims

1. A process for preparing a vaccine which comprises:

(a) preparing a carrier bed from a slurry of particulate material;

(b) applying a liquid suspension of eucaryotic cells to the bed;

(c) allowing the cells trapped within the internal cavities or spaces of the bed to grow;

(d) circulating nutrient medium through the bed, whereby nutrients are delivered to the cells trapped within the internal cavities and metabolic and degradation products are removed in the liquid leaving the bed;

(e) infecting the cells trapped within the internal cavities with a microorganism to which the cells are susceptible;

(f) propagating the microorganism within the cells by circulating through the bed a medium suitable for growth of the microorganism;

(g) collecting the medium leaving the bed containing the microorganisms which are released following disruption of the cells, whilst retaining cell debris within the bed;

(h) inactivating the microorganism with an inactivating agent; and

(i) adding the inactivated microorganism to a pharmaceutically acceptable carrier therefor.

4,085,204

PROCESS FOR OBTAINING INSULIN LIKE ACTIVE SUBSTANCES

Adolf Wacker; Dörthe Wacker, both of Neu-Isenburg; Klaus Pöhler, Wiesbaden, all of Germany, and Hellmut Mittenzwei, Pixisstrasse 10, 8000 Munich 80, Germany, assignors to Helmut Mittenzwei, Munich, Germany

Filed Dec. 9, 1976, Ser. No. 748,956

Claims priority, application Germany, Dec. 24, 1975, 2558537

Int. Cl.[2] A61K *35/14, 35/16, 37/02*

U.S. Cl. 424—101 8 Claims

1. A process for obtaining insulin-like active substances from blood or a blood component of a warm-blooded animal, which comprises the steps of pretreating the blood or blood component by diluting the blood or blood component with from about half to about four volumes of a hydrophilic diluent, adjusting the pH of the resulting solution to a value of from 2 to 4 or of from 8 to 10, incubating the pre-treated blood at a temperature of from about 15 to about 40° C for a period of at least four hours, cooling the incubated blood to a temperature of less than 10° C, dialysing the treated blood after neutralization against a membrane adapted to pass molecules having a molecular weight of less than 6000, and recovering from dialysate organic peptide substances having a molecular weight of from about 1000 to about 5000, and an insulin-like activity of from about 14 to about 40 μU/mg solid.

4,085,205

CONTROL OF SEX RATIO IN MAMMALIAN OFFSPRING

Richard John Taylor Hancock, Bristol, England, assignor to The University Court of the University of Edinburgh, Edinburgh, Scotland

Filed Jan. 24, 1977, Ser. No. 761,945

Claims priority, application United Kingdom, Jan. 27, 1976, 3039/76

Int. Cl.[2] A61K *35/52;* C12K *9/00;* A61K *39/00*

U.S. Cl. 424—105 5 Claims

1. In the artificial insemination of female mammals, a method of controlling the sex ratio of the mammalian offspring to increase the proportion of females, which comprises the steps of obtaining serum from an animal which previously has been immunized with bird sperm to cause the formation in the serum of antibodies to bird sperm, mixing semen collected from a male mammal with said antibodies to bird sperm in said serum, and artificially inseminating a corresponding female mammal with said mixture.

3. In the artificial insemination of female mammals, a method of controlling the sex ratio of the mammalian offspring to increase the proportion of males, which comprises the steps of obtaining serum from an animal which previously has not been immunized with sperm, mixing semen collected from a male mammal with said serum and artificially inseminating a corresponding female mammal with said mixture.

4,085,206

COMPOSITION FOR TREATMENT OF INFECTIOUS DISEASES IN ANIMALS

Josef Rokos; Zdeněk Kubat; Pavel Prochazka; Vladislav Zalabák, all of Prague, Czechoslovakia; Josef Babička, deceased, late of Prague, Czechoslovakia (by Marie Babičkova, legal representative; Eva Zemanova, heir; Luboš Babička, heir); Jirí Janeček, Prague, Czechoslovakia; Miroslav Nohynek, Prague, Czechoslovakia, and Petr Mison, Prague, Czechoslovakia assignors to Ceskoslovenska akademia ved, Prague Czechoslovakia

Continuation-in-part of Ser. No. 474,247, May 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,740

Claims priority, application Czechoslovakia, May 31, 1973, 3944/73

Int. Cl.[2] A61K *33/24*

U.S. Cl. 424—131 3 Claims

1. A method for treating trichophytosis of cattle, orf in sheep

and goats or cow pox which comprises topically applying to said animal in need of said treatment a composition comprising from 10^{-5} M to $2.1.10^{-1}$M $CoCl_2$ with a pharmaceutical carrier, the composition being employed in an amount sufficient to cure the trichophytosis of cattle, orf or cow pox.

4,085,207
AMINO ACID PARENTERAL SOLUTION CONTAINING REDUCING SUGAR

Mitsuo Aoki; Kazuhiko Watanabe; Shunichi Murase, all of Maruto, and Isao Hiraoka, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Factory, Inc., Japan

Filed Mar. 24, 1976, Ser. No. 670,070
Claims priority, application Japan, Apr. 1, 1975, 50-40072
Int. Cl.[2] A61K *31/70, 31/40*
U.S. Cl. 424—180 **4 Claims**

1. A heat sterilized amino acid parenteral solution containing from about 0.06 to about 0.4 W/V% of a mixture of (i) at least one N-acyl-L-tryptophan and at least one N-acyl-L-proline, and (ii) from about 3 to about 25 W/V% of at least one reducing sugar, said N-acyl-L-tryptophan being at least one species selected from the group consisting of N-acetyl-L-tryptophan, N-lactyl-L-tryptophan, N-phenylacetyl-L-tryptophan, N-phenoxyacetyl-L-tryptophan, N-carbobenzoxy-L-tryptophan, N-oleyl-L-tryptophan, N-maleyl-L-tryptophan, N-benzoyl-L-tryptophan, N-glycyl-L-tryptophan and N-leucyl-L-tryptophan, said N-acyl-L-proline being at least one species selected from the group consisting of N-acetyl-L-proline, N-lactyl-L-proline, N-phenylacetyl-L-proline, N-phenoxyacetyl-L-proline, N-benzoyl-L-proline, N-carbobenzoxy-L-proline, N-valyl-L-proline, N-maleyl-L-proline, N-oleyl-L-proline, N-glycyl-L-proline and N-leucyl-L-proline, said reducing sugar being at least one species selected from the group consisting of glucose, fructose, maltose and lactose.

4,085,208
PROCESS FOR PREPARING 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS AND NOVEL 1-EPIMERS AND 1-N-ALKYL DERIVATIVES PRODUCED THEREBY; METHODS FOR THE USE OF THE 1-EPIMER DERIVATIVES AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Alan K. Mallams, West Orange, N.J., and David Huw Davies, Macclesfield, England, assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 21, 1976, Ser. No. 697,805
Int. Cl.[2] A61K *31/71;* **C07H** *15/22*
U.S. Cl. 424—180 **30 Claims**

29. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection which comprises administering to said animal a non-toxic anti-bacterially effective amount of a 1-epi-N-X-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitol selected from the group consisting of 1-epi-N-X-gentamicin A, 1-epi-N-X-gentamicin B, 1-epi-N-X-gentamicin B_1, 1-epi-N-X-gentamicin C_1, 1-epi-N-X-gentamicin C_{1a}, 1-epi-N-X-gentamicin C_2, 1-epi-N-X-gentamicin C_{2a}, 1-epi-N-X-gentamicin C_{2b}, 1-epi-N-X-gentamicin X_2, 1-epi-N-X-kanamycin A, 1-epi-N-X-kanamycin B, 1-epi-N-X-3′,4′-dideoxykanamycin B, 1-epi-N-X-sisomicin, 1-epi-N-X-verdamicin, 1-epi-N-X-tobramycin, 1-epi-N-X-Antibiotic G-52, 1-epi-N-X-Antibiotic G-418, 1-epi-N-X-Antibiotic 66-40B, 1-epi-N-X-Antibiotic 66-40D, 1-epi-N-X-Antibiotic JI-20A, 1-epi-N-X-Antibiotic JI-20B,

the 5-epi, 5-epi-azido-5-deoxy, 5-epi-amino-5-deoxy analogs of the foregoing; 1-epi-N-X-Antibiotic Mu-1, 1-epi-N-X-Antibiotic Mu-2, 1-epi-N-X-Antibiotic Mu-4, 1-epi-N-X-Antibiotic Mu-5;

and the pharmaceutically acceptable acid addition salts thereof,

wherein X is a substituent selected from the group consisting of hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkylalkyl, aralkyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, aminohydroxyalkyl, alkylaminohydroxyalkyl and dialkylaminohydroxyalkyl, said X substituent having less than 9 carbon atoms with the proviso that,

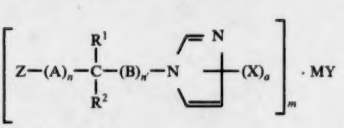
said aminohydroxyalkyl, alkylaminohydroxyalkyl and dialkylaminohydroxyalkyl substituents must have the amino and hydroxyl groups on different carbon atoms, and that neither substituent be on the carbon atom alpha to the 1-amino function.

4,085,209
PREPARATION AND SAFENING EFFECT OF 1-SUBSTITUTED IMIDAZOLE METAL SALT COMPLEXES

George Allen Miller, Glenside, and Harold Edwin Carley, Chalfont, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 5, 1975, Ser. No. 547,290
Int. Cl.[2] C07F *3/06, 3/00, 1/00;* **A01N** *9/22*
U.S. Cl. 424—245 **10 Claims**

1. A metal salt complex of the formula



wherein Z is phenyl substituted with up to two substituents selected from the group consisting of fluoro, chloro, bromo, iodo, nitro, trihalomethyl, methyl, ethyl, methoxy and ethoxy; naphthyl furanyl; benzofuranyl; thienyl or halothienyl;

R^1 is hydrogen;

R^2 is independently selected from the group consisting of hydrogen, (C_1–C_8) alkoxy, (C_2–C_8) alkenoxy, (C_2–C_8) alkynoxy (C_1–C_8) alkylthio, halo, hydroxy, acetoxy, benzoyloxy, (C_1–C_4) alkylamino, (C_6–C_{10}) phenylhydrazino; or

R^1 and R^2 are taken together with the attached carbon to form a carbonyl, (C_1–C_2) ketal, (C_1–C_2) thioketal, hydroxyimino, (C_1–C_4) alkylimino or (C_6–C_{10}) phenylhydrazono;

A and B are divalent (C_1–C_4) alkylene groups;

X is methyl or halogen;

a is an integer from 0 to 3;

n is an integer from 0 to 1;

n′ is an integer from 0 to 1;

M is a metal selected from the group consisting of calcium, magnesium, manganese, copper, nickel, zinc, iron, cobalt, tin, cadmium, mercury, chromium, lead and barium;

Y is an anion counterion selected from the group consisting of chloride, bromide, iodide, sulfate, bisulfate, phosphate, nitrate, perchlorate, carbonate, bicarbonate, hydrosulfide, hydroxide, acetate, oxalate, malate, citrate and ethylene-bis-dithiocarbamate; and

m is an integer from 1 to 4.

6. A method for controlling phytopathogenic fungi which comprises applying a fungicidally effective amount of a metal salt complex according to claim 1 to a plant, to plant seeds or to the plant habitat.

9. A fungicidal composition which comprises an agronomically acceptable carrier and, as the active ingredient, a fungicidally effective amount of a complex of claim 1.

4,085,210
NOVEL MORPHOLINE DERIVATIVES AND THE TREATMENT OF MENTAL DEPRESSION

Junki Katsube, Toyonaka; Atsuyuki Kojima, Nishinomiya; Makoto Sunagawa, Toyonaka; Yoshinori Takashima, Nishinomiya; Yoshito Kameno, Minoo, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

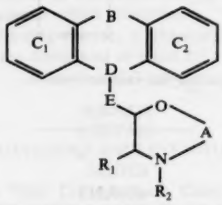
Filed Jan. 6, 1976, Ser. No. 646,908

Claims priority, application Japan, Jan. 6, 1975, 50-4540; Jun. 4, 1975, 50-67767

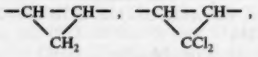
Int. Cl.[2] C07D *409/06;* A61K *31/535;* C07D *265/30, 405/06*

U.S. Cl. 424—248.4 10 Claims

1. A compound of the formula:



wherein R_1 is hydrogen or C_1–C_4 alkyl, R_2 is hydrogen, C_1–C_4 alkyl, C_3–C_6 alkenyl, C_3–C_6 alkynyl, aryl(C_1–C_4)alkyl, (C_3–C_6)-cycloalkyl(C_1–C_4)alkyl, polyhalo(C_2–C_4)alkyl or hydroxy(C_2–C_4)alkyl, A is straight or branched C_2–C_4 alkylene, B is $-CH_2-C_2-$, $-CH=CH-$,



$-CH_2-O-$, $-CH_2-S-$, $-S-$ or $-O-$, $>D-E-$ is $>C=CH-$ and C_1 and C_2 are each 1,2-phenylene optionally substituted with one or more substituents selected from the group consisting of halogen, C_1–C_4 alkyl and C_1–C_4 alkoxy, or a non-toxic salt thereof.

8. 5-(4-Methylmorpholin-2-yl)methylidene-5H-dibenzo[a,d]-cycloheptene, or a non-toxic salt thereof.

4,085,211
PYRAZINECARBOXAMIDES AND PROCESSES FOR PREPARING SAME

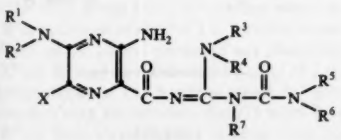
Edward J. Cragoe, Jr., Lansdale; Otto W. Woltersdorf, Jr., Chalfont, and Charles N. Habecker, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 640,803, Dec. 15, 1975, abandoned. This application Sep. 13, 1976, Ser. No. 722,442

Int. Cl.[2] A61K *31/495;* C07D *295/18*

U.S. Cl. 424—250 20 Claims

1. A compound of the formula:



wherein

R^1 is hydrogen, lower alkyl having from 1 to 5 carbon atoms cycloalkyl having from 3 to 6 carbon atoms, lower alkenyl having from 2 to 3 carbon atoms;

R^2 is hydrogen, lower alkyl having 1 to 5 carbon atoms;

R^1 and R^2 are joined to form with the nitrogen atom to which they are attached a pyrrolidine or piperazine ring;

R^3 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;

R^4 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;

R^5 is hydrogen, lower alkyl having 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms; phenyl or substituted phenyl wherein the substituent is lower alkyl or halo; benzyl or phenethyl; trifluoroethyl, lower alkylamino, diloweralkylamino, allyl, propargyl, pyridyl, furfuryl, methoxy or hydroxy ethyl; ethoxy carbonyl methyl or carboxy methyl;

R^6 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 10 nuclear carbon atoms;

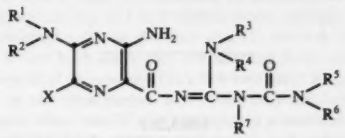
R^5 and R^6 are joined to form a piperazine or morpholine ring with the nitrogen atom to which they are attached;

R^7 is hydrogen, lower alkyl having 1 to 5 carbon atoms;

R^3 and R^7 are joined to form an alkylene bridge of 2 carbon atoms;

X is halogen; and the pharmaceutically acceptable non-toxic acid addition salts thereof.

13. A method of treating edema and/or hypertension which comprises administering to a patient a pharmacologically acceptable does of a compound of the formula:



wherein

R^1 is hydrogen, lower alkyl having from 1 to 5 carbon atoms cycloalkyl having from 3 to 6 carbon atoms, lower alkenyl having from 2 to 3 carbon atoms;

R^2 is hydrogen, lower alkyl having 1 to 5 carbon atoms;

R^1 and R^2 are joined to form with the nitrogen atom to which they are attached a pyrrolidine or piperazine ring;

R^3 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;

R^4 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;

R^5 is hydrogen, lower alkyl having 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms; phenyl or substituted phenyl wherein the substituent is lower alkyl or halo; benzyl or phenethyl; trifluoroethyl, lower alkylamino, diloweralkylamino, allyl, propargyl, pyridyl, furfuryl, methoxy or hydroxy ethyl; ethoxy carbonyl methyl or carboxy methyl;

R^6 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 10 nuclear carbon atoms;

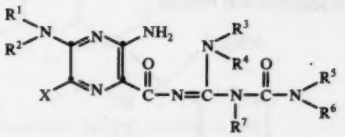
R^5 and R^6 are joined to form a piperazine or morpholine ring with the nitrogen atom to which they are attached;

R^7 is hydrogen, lower alkyl having 1 to 5 carbon atoms;

R^3 and R^7 are joined to form an alkylene bridge of 2 carbon atoms;

X is halogen; and the pharmaceutically acceptable non-toxic acid addition salts thereof.

17. A pharmaceutical composition consisting essentially of an active ingredient of a compound of the formula:



wherein

R^1 is hydrogen, lower alkyl having from 1 to 5 carbon atoms cycloalkyl having from 3 to 6 carbon atoms, lower alkenyl having from 2 to 3 carbon atoms;

R^2 is hydrogen, lower alkyl having 1 to 5 carbon atoms;
R^1 and R^2 are joined to form with the nitrogen atom to which they are attached a pyrrolidine or piperazine ring;
R^3 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;
R^4 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms;
R^5 is hydrogen, lower alkyl having 1 to 5 carbon atoms; cycloalkyl having from 3 to 6 nuclear carbon atoms; phenyl or substituted phenyl wherein the substituent is lower alkyl or halo; benzyl or phenethyl; trifluoroethyl, lower alkylamino, diloweralkylamino, allyl, propargyl, pyridyl, furfuryl, methoxy or hydroxy ethyl; ethoxy carbonyl methyl or carboxy methyl;
R^6 is hydrogen, lower alkyl having from 1 to 5 carbon atoms; cycloalkyl having from 3 to 10 nuclear carbon atoms;
R^5 and R^6 are joined to form a piperazine or morpholine ring with the nitrogen atom to which they are attached;
R^7 is hydrogen, lower alkyl having 1 to 5 carbon atoms;
R^3 and R^7 are joined to form an alkylene bridge of 2 carbon atoms;
X is halogen; and the pharmaceutically acceptable non-toxic acid addition salts thereof.

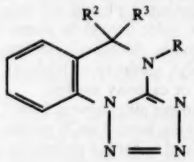
4,085,212

PESTICIDAL DIHYDROTETRAZOLO [1,5-a] QUINAZOLINE COMPOUND AND PROCESSES AND COMPOSITIONS FOR USING THE SAME

Raymond Alexander Burrell, Camberley, and John Michael Cos, Workingham, both of England, assignors to Imperial Chemical Industries Limited, London, England

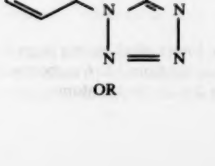
Filed Aug. 6, 1976, Ser. No. 712,375
Claims priority, application United Kingdom, Aug. 14, 1975, 33931/75
Int. Cl.[2] A01N *9/22;* **C07D** *487/04*
U.S. Cl. 424—251 **6 Claims**

1. A dihydrotetrazolo[1,5-a]quinazoline compound which in free base form has the formula:



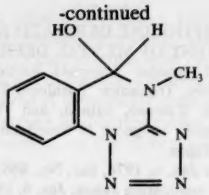
wherein R^3 is hydrogen, hydroxy or dialkylamino of from 1 to 4 carbon atoms; R^2 is dialkylamino of from 1 to 4 carbon atoms when R^3 is dialkylamino and R^2 is hydrogen when R^3 is hydrogen or hydroxy; and R is a lower alkyl of from 1 to 4 carbon atoms.

5. A pesticidal composition comprising as active ingredient, an effective amount of a quinazoline compound having in free base form the structural formula:

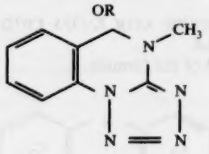


OR

-continued



OR



together with a carrier for said derivative.

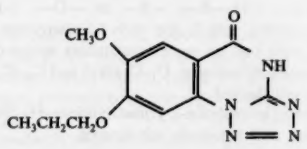
4,085,213

TETRAZOLO[A]QUINAZOL-5-ONES ANTIALLERGY AND ANTIULCER AGENTS

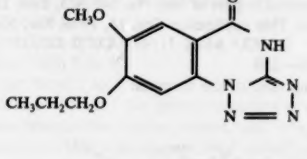
Jasjit S. Bindra, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 653,250, Jan. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 594,765, Jul. 10, 1975, abandoned. This application Dec. 23, 1976, Ser. No. 753,856
Int. Cl.[2] A61K *31/305;* **C07D** *487/04*
U.S. Cl. 424—251 **3 Claims**

1. A compound of the formula:



2. A method of inhibiting the release of mediators of anaphylaxis in a mammalian subject which comprises administering orally, intranasally, parenterally or by inhalation to the subject an anaphylaxis mediator release inhibiting amount of a compound having the formula:



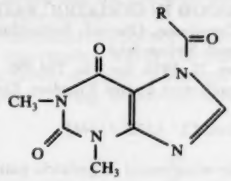
4,085,214

STABLE PRO-DRUG FORMS OF THEOPHYLLINE

Takeru Higuchi; Nicolae S. Bodor, and Yu-Neng Kuo, all of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Oct. 18, 1976, Ser. No. 732,979
Int. Cl.[2] A61K *31/52;* **C07D** *473/08*
U.S. Cl. 424—253 **8 Claims**

1. A pro-theophylline compound of the formula:



(I)

wherein R represents a straight or branched phenylalkenyl group having 2–8 carbon atoms in the alkenyl portion.

5. A method for inducing a non-toxic, sustained therapeutically effective release of theophylline in the bloodstream of a warm-blooded animal which comprises:

orally administering thereto, a pharmaceutically effective amount of the compound of claim 1.

4,085,215

CERTAIN 5,6,7,8-TETRAHYDROQUINOLINE-8-THIOCARBOXAMIDES

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Ltd., Taplow, England

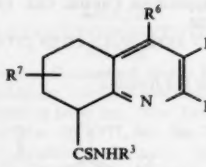
Continuation-in-part of Ser. No. 460,265, Apr. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Jul. 30, 1975, Ser. No. 600,257

Claims priority, application United Kingdom, Feb. 4, 1974, 4950/74; Mar. 27, 1974, 13513/74; Mar. 27, 1974, 13515/74; Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; Jul. 21, 1973, 34866/73; Aug. 16, 1973, 38701/73; Oct. 17, 1972, 48595/72

Int. Cl.[2] C07D *215/48;* **A61K** *31/47, 31/44*

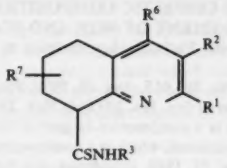
U.S. Cl. 424—258 **18 Claims**

1. A compound of the formula



or a acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen, trifluoromethyl, alkyl having from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms, or phenyl groups or R^1 and R^2 taken together represent a polymethylene chain of 3 to 5 carbon atoms, R^7 represents hydrogen or from 1 to 3 groups selected from alkyl of 1 to 6 carbon atoms (which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl), phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and phenyl groups, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and any of the phenyl or the phenyl portion of any phenylalkyl groups R^1, R^2, R^6 and R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisos that (1) when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

17. A method of treating ulcers in an afflicted host which method comprises administering to said host a compound of the formula



or a acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen, trifluoromethyl, alkyl having from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms, or phenyl groups, or R^1 and R^2 taken together represent a polymethylene chain of 3 to 5 carbon atoms, R^7 represents hydrogen or from 1 to 3 groups selected from alkyl of 1 to 6 carbon atoms (which may be substituted by alkoxy of 1 to 5 carbon atoms or trifluoromethyl), phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and phenyl groups, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and any of the phenyl or the phenyl portion of any phenylalkyl groups R^1, R^2, R^6 and R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisos that (1) when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups.

4,085,216

2-(4-PHENYL-4-CYANO-N-BUTYL)-1,2,3,4-TETRAHYDRO-5(H)-PYRIDO-[4,3,b]-INDOLES AND SALTS THEREOF

Adolf Langbein, Ingelheim am Rhein; Karl-Heinz Weber, Gau-Algesheim; Adolf Bauer, Rosenheim; Karin Böke, Ingelheim am Rhein; Erich Lehr, Waldalgesheim, and Franz Josef Kuhn, Bingen, Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

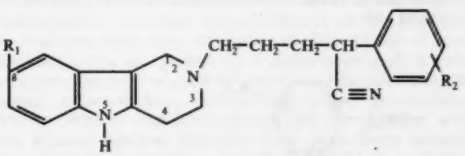
Filed May 9, 1977, Ser. No. 794,937

Claims priority, application Germany, May 15, 1976, 2621729

Int. Cl.[2] A61K *31/44;* **C07D** *471/14*

U.S. Cl. 424—263 **6 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, halogen or methyl, and

R_2 is hydrogen, halogen, methyl or methoxy, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A neuroleptic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective neuroleptic amount of a compound of claim 1.

4,085,217

PROCESS AND COSMETIC COMPOSITIONS FOR THE TREATMENT OF SKIN AND SCALP

Gregoire Kalopissis, Paris, France, assignor to L'Oreal, Paris, France

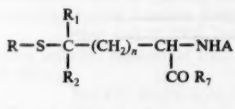
Division of Ser. No. 501,615, Aug. 29, 1974, Pat. No. 3,976,781, which is a division of Ser. No. 203,046, Nov. 29, 1971, Pat. No. 3,849,576, which is a continuation-in-part of Ser. No. 736,960, Jun. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 427,976, Jan. 25, 1965, abandoned, and Ser. No. 602,480, Dec. 19, 1966, abandoned, Ser. No. 794,363, Jan. 27, 1969, abandoned, Ser. No. 801,840, Feb. 24, 1969, abandoned, Ser. No. 817,193, Apr. 17, 1969, abandoned, Ser. No. 858,161, Sep. 15, 1969, Pat. No. 3,671,643, Ser. No. 12,122, Feb. 17, 1970, abandoned, and Ser. No. 36,405, May 11, 1970, abandoned. This application Aug. 12, 1976, Ser. No. 714,000

Claims priority, application France, Jan. 29, 1964, 64.961897; Luxembourg, Dec. 22, 1965, 50125; France, Jun. 21, 1967, 67.111396; Jul. 28, 1967, 67.116160; Luxembourg, Jan. 29, 1968, 55371; Feb. 23, 1968, 55553; Apr. 19, 1969, 55935; Belgium, Jun. 3, 1969, 74877; Luxembourg, Feb. 19, 1969, 58042; May 12, 1969, 58634; Apr. 23, 1971, 63056; Apr. 23, 1971, 63057

Int. Cl.[2] A61K *31/455*

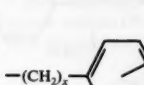
U.S. Cl. 424—266 **12 Claims**

1. A cosmetic composition for topical application to a human's scalp and skin characterized by an excessive secretion of sebum to improve the condition thereof by reducing said excessive secretion of sebum comprising a non-toxic cosmetic carrier suitable for topical application to the scalp or skin and a non-toxic active component present in amounts effective to reduce excessive secretion of sebum, said active component being selected from the group consisting of a compound having the formula:

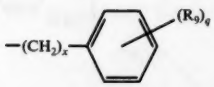


wherein n is 0 or 1 and when n is 0 R_1 and R_2 are selected from the group consisting of hydrogen and CH_3, and when n is 1, R_1 and R_2 are hydrogen; R_7 is selected from the group consisting of hydroxy and alkoxy containing 1–5 carbon atoms,

A is



and R is selected from the group consisting of $-C(C_6H_5)_3$, $-CH(C_6H_5)_2$, $-CH(C_6H_4p-OCH_3)_2$, $-C(CH_3)_2$ (C_6H_4 $p-OCH_3$), $-(CH_2)_z-R_8$ wherein z is 0 or 1 and R_8 is selected from the group consisting of naphthyl-1 and naphthyl-2 and



wherein x is 0–2 and wherein when q is 1, 2 or 3, R_9 is selected from the group consisting of hydrogen, halogen, alkoxy having 1–5 carbon atoms and linear or branched chain alkyl having 1–4 carbon atoms, and when q is 1, R_9 is selected from the group consisting of acetamide, amino, phenoxy, cyclohexyl, trifluoromethyl, phenyl, dialkylamino wherein each alkyl moiety has 1–5 carbon atoms.

4,085,218

ELEVATING MOOD IN GERIATRIC PATIENTS

Kurt Anton Fisher-Cornelssen, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

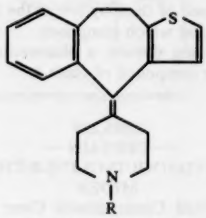
Filed Oct. 21, 1976, Ser. No. 734,696

Claims priority, application United Kingdom, Oct. 30, 1975, 44878/75

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **11 Claims**

1. A method of elevating mood in geriatric patients, which comprises administering to a geriatric patient in need of said treatment a mood elevating effective quantity of a compound of the formula:



wherein R is lower alkyl,

or a pharmaceutically acceptable acid addition salt form thereof.

4,085,219

1-OXO-2,2-DISUBSTITUTED-5-INDANYLOXY(OR THIO)ALKANOIC ACIDS

Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

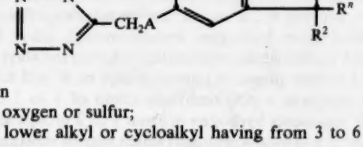
Division of Ser. No. 399,571, Sep. 21, 1973, Pat. No. 3,984,465. This application Jul. 13, 1976, Ser. No. 704,851

Claims priority, application Canada, Oct. 13, 1972, 153921; Aug. 28, 1973, 178824

Int. Cl.[2] A61K *31/45*; C07D *257/04*

U.S. Cl. 424—269 **11 Claims**

1. A compound of the formula



wherein

A is oxygen or sulfur;

R is lower alkyl or cycloalkyl having from 3 to 6 carbon atoms;

R^1 is lower alkyl, lower alkenyl, halo lower alkenyl, lower alkynyl, phenyl lower alkyl, phenyl lower alkenyl, hydroxy lower alkyl, lower alkoxy lower alkyl, oxo lower alkyl or hydroxy cycloalkyl, cycloalkyl alkyl containing 4 to 7 carbon atoms;

R and R^1 may be joined together with the carbon atom to which they are attached to form cycloalkyl or hydroxy cycloalkyl;

R^2 is hydrogen, halo, lower alkyl, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo;

R^n is hydrogen or methyl;

X^1 is hydrogen, methyl or halo; and

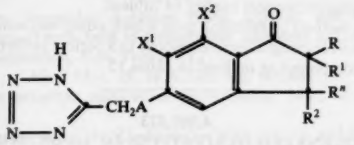
X^2 is methyl or halo; or

X^1 and X^2 may be joined to form a hydrocarbylene chain containing 3 to 4 carbon atoms; and

Y is alkylene or haloalkylene containing a maximum of 4

carbon atoms, and the non-toxic pharmacologically acceptable salts thereof.

7. A pharmaceutical composition useful in the treatment of edema and hypertension which also maintains uric acid at pretreatment levels or causes a decrease in uric acid levels which comprises 10 mg. to 500 mg. of a compound of the formula:



wherein

A is oxygen or sulfur;

R is lower alkyl or cycloalkyl having from 3 to 6 carbon atoms;

R^1 is lower alkyl, lower alkenyl, halo lower alkenyl, lower alkynyl, phenyl lower alkyl, phenyl lower alkenyl, hydroxy cycloalkyl or hydroxy lower alkyl, lower alkoxy lower alkyl, oxo lower alkyl or cycloalkyl lower alkyl; or

R and R^1 may be joined to form a cycloalkyl or hydroxy cycloalkyl;

R^2 is hydrogen, halo, phenyl or substituted phenyl wherein the substituent is lower alkyl or halo or lower alkyl;

R'' is methyl or hydrogen;

X^1 is hydrogen, methyl or halo; and

X^2 is methyl or halo; or

X^1 and X^2 may be joined to form a hydrocarbylene chain containing 3 to 4 carbon atoms and

Y is alkylene or haloalkylene containing a maximum of 4 carbon atoms, and the non-toxic, pharmacologically acceptable salts and a pharmaceutically acceptable carrier thereof.

4,085,220

2-ALKENYL-N-[(TRICHLOROMETHYL)THIO]SUCCINIMIDES

Wilhelm Sandermann, Donaustauf; Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, all of Germany, assignors to Sterling Drug Inc., New York, N.Y.

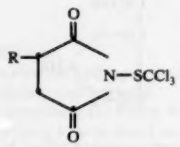
Filed Mar. 30, 1977, Ser. No. 782,750

Claims priority, application Germany, Apr. 7, 1976, 2614935

Int. Cl.[2] C07D *207/40;* **A61K** *31/40*

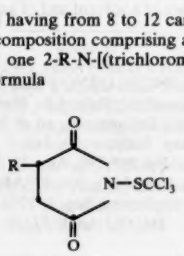
U.S. Cl. 424—274 **9 Claims**

1. A 2-R-N-[(trichloromethyl)thio]succinimide having the formula



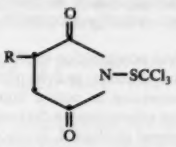
where R is alkenyl having from 8 to 12 carbon atoms.

4. A fungicidal composition comprising as active fungicidal ingredient at least one 2-R-N-[(trichloromethyl)thio]succinimide having the formula



where R is alkenyl having from 8 to 12 carbon atoms, and a carrier therefor.

7. A method for preventing or retarding the deleterious effects associated with fungus contamination on a material susceptible to fungus contamination which comprises treating the material with a fungicidally effective amount of at least one 2-R-N-[(trichloromethyl)thio]succinimide of the formula



where R is alkenyl having from 8 to 12 carbon atoms.

4,085,221

ETHANOLAMINE DERIVATIVES

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 26, 1976, Ser. No. 745,164

Claims priority, application United Kingdom, Dec. 5, 1975, 50037/75

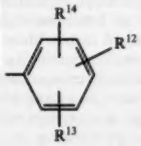
Int. Cl.[2] A61K *31/38;* **C07D** *307/81*

U.S. Cl. 424—275 **11 Claims**

1. An ethanolamine derivative selected from the group consisting of a compound of the formula:

$$R—CHOH.CH_2NH—A—NH—X—Y—R^1$$

wherein A is alkylene of from 2 to 12 carbon atoms; wherein X is carbonyl (—CO—) or sulphonyl ($—SO_2—$); wherein Y is a direct link, or alkylene or alkyleneoxy each of up to 6 carbon atoms, or imino (—NH—), or alkylimino, iminoalkylene, iminoalkyleneoxy or iminoalkylenecarbonyloxy each of up to 6 carbon atoms, or (except when R^1 is hydrogen) is oxygen; and wherein R is benzothienyl, benzodioxanyl, or benzofuryl which is unsubstituted or which contains one or more substituents selected from halogen and alkyl of up to 6 carbon atoms, and R^1 is hydrogen, or alkyl, alkenyl, halogenoalkyl or cycloalkyl each of up to 6 carbon atoms, or benzothienyl, benzodioxanyl, or benzofuryl as defined above for R, or is aryl of the formula:



wherein R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^{12} and R^{13} together form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl, wherein R^{14} is hydrogen or amidic of the formula:

$$R^{15}R^{16}N—CO—Q—$$

$$R^{15}R^{16}N—CO—NH—Q—$$

$$R^{15}R^{16}N—CO—Q^1—O—$$

or

$$R^{16}—X—NR^{15}—Q—$$

wherein Q is a direct link or alkylene or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen, alkenyl, cycloalkyl, hydroxyalkyl, or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; and a non-toxic pharmaceutically-acceptable acid-addition salt thereof.

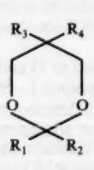
9. A pharmaceutical composition useful for the treatment of prophylaxis of heart diseases and hypertension in a warm blooded animal comprising as active ingredient an effective amount of at least one ethanolamine derivative or an acid-addition salt thereof, claimed in claim **1**, in association with a pharmaceutically-acceptable diluent or carrier therefor.

4,085,222
PHARMACEUTICAL COMPOSITIONS CONTAINING 1,3-DIOXANES

Deryck Rhodes, and Roger Frank Newton, both of London, England, assignors to Allen & Hanburys Limited, London, England

Filed Nov. 12, 1974, Ser. No. 523,238
Claims priority, application United Kingdom, Nov. 21, 1973, 53924/73
Int. Cl.[2] **A61K** *31/335*
U.S. Cl. 424—278 **26 Claims**

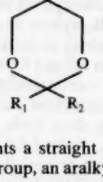
1. Compounds of the formula



(I)

in which R_1 represents cycloalkyl, aralkyl, or substituted phenyl, in which the substituents on the phenyl group are one or more of the following groups, halogen, hydroxy, alkoxy (C_1–C_4), alkyl (C_1–C_4), nitro, or dialkylamino; R_2 represents a hydrogen atom, or R_1 and R_2 together with the adjacent carbon atom represent a cycloalkyl group with 3 to 7 carbon atoms inclusive; R_3 represents a group R_5CO—, or $R_5CH(OH)$— in which R_5 is methyl or ethyl; R_4 is an alkyl group (C_1–C_6) or a phenyl group; and in which where R_4 is alkyl, R_3 and R_4 may be linked together to produce a 5-, 6- or 7-membered hydrocarbyl spirocyclic system with the adjacent carbon atom of the dioxan ring; and where the compounds contain hydroxyl groups, esters with alkanoic acids of such compounds; and where the compounds contain basic centres, non-toxic pharmaceutically acceptable salts with organic or inorganic salts.

15. A pharmaceutical composition comprising as active ingredient one or more compounds of the formula:



I(a)

in which R_1 represents a straight or branched (C_1–C_6) alkyl group, a cycloalkyl group, an aralkyl (C_1–C_4) group, or phenyl group, which phenyl group may optionally be substituted by one or more of the following groups, halogen, hydroxy, alkoxy (C_1–C_4), alkyl (C_1–C_4), nitro or dialkylamino; R_2 represents a hydrogen atom, or R_1 and R_2 together with the adjacent carbon atom represent a cycloalkyl group with 3 to 7 carbon atoms inclusive; R_3 represents a group $HOCH_2$—, R_5CO— or $R_5CH(OH)$—, where R_5 is methyl or ethyl; R_4 is an alkyl group (C_1–C_6) or a phenyl group; and in which where R_4 is alkyl, R_3 and R_4 may be linked together to produce a 5-, 6- or 7-membered hydrocarbyl spirocyclic system with the adjacent carbon atom of the dioxan ring; and where the compounds contain hydroxyl groups, esters with alkanoic acids of such compounds; and where the compounds contain basic centres, non-toxic pharmaceutically acceptable salts with organic or inorganic acids; in a pain relieving effective amount in association with a pharmaceutical carrier or diluent.

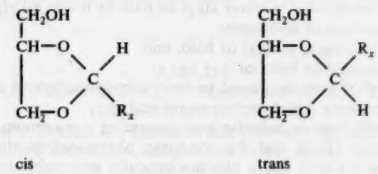
26. A method of relieving pain which comprises administering a pain-relieving effective amount to a patient suffering from pain a compound as defined in claim **15**.

4,085,223
HALOGENATED DERIVATIVES OF 1,3-DIOXOLANE HAVING MUCOLYTIC ACTIVITY

Massimo Carissimi; Franco Ravenna, and Giorgio Cantarelli, all of Milan, Italy, assignors to Maggioni & C. S.p.A., Milan, Italy

Filed Mar. 24, 1976, Ser. No. 670,174
Claims priority, application Italy, Apr. 2, 1975, 21929 A/75
Int. Cl.[2] **A61K** *31/335;* **C07D** *317/10*
U.S. Cl. 424—278 **10 Claims**

1. A substance comprising a mixture of the cis- and trans-isomers of 4-hydroxymethyl-2-monohaloalkyl-1,3-dioxolane having the formulae



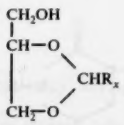
cis trans

wherein R_x is selected from monobromoalkyl, alkyl having 1-4 carbon atoms and iodomethyl.

5. A therapeutic composition useful as an expectorant and fluidizer of tracheobronchial mucus comprising an expectorant or fluidizing effective amount of the compound of claim **1**.

6. A method for increasing the secretion of laryngobronchial fluid while reducing the viscosity of such fluid comprising administering to a mammal having such condition an expectorant or fluidizing effective amount of a substance according to claim **1**.

8. A process for preparing the compounds of claim **1** in which halo designates iodo comprising heating a compound of the formula



in which R_x is monobromoalkyl, alkyl having 1 to 4 carbon atoms in the presence of a solvent and of an alkali metal iodide.

4,085,224
METHOD OF INCREASING FEED UTILIZATION

David H. Berg, Greenfield; Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 569,740, Apr. 21, 1975, which is a continuation-in-part of Ser. No. 477,954, Jun. 10, 1974, abandoned. This application Sep. 2, 1976, Ser. No. 719,742
Int. Cl.[2] **A61K** *31/35*
U.S. Cl. 424—283 **2 Claims**

1. A method of increasing feed-utilization efficiency in a

ruminant animal which comprises orally administering to said animal in need of increasing the feed-utilization efficiency an effective propionate-increasing amount of salinomycin or a physiologically-acceptable salt of salinomycin.

4,085,225

OXIME ETHERS HAVING ANTI-DEPRESSIVE ACTIVITY

Hendricus Bernardus Antonius Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

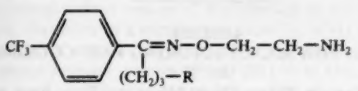
Filed Mar. 19, 1976, Ser. No. 668,461

Claims priority, application Netherlands, Mar. 20, 1975, 7503310

Int. Cl.[2] A61K *31/15, 31/275;* **C07C** *121/78, 131/00*

U.S. Cl. 424—304 **8 Claims**

1. Oxime ether compounds of the formula



(I)

and salts thereof with pharmaceutically acceptable acids, in which formula R is a cyano group, a cyanomethyl group, a methoxymethyl group or an ethoxymethyl group.

7. An antidepressive composition comprising a compound of claim 1 in an antidepressively effective amount and a pharmaceutically acceptable carrier therefore.

4,085,226

INSECTICIDAL N-(SUBSTITUTED PHENYL)-N'-BENZOYL UREAS

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

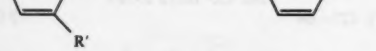
Filed Jun. 24, 1976, Ser. No. 699,396

Claims priority, application Germany, Jul. 12, 1975, 2531279

Int. Cl.[2] C07C *127/22;* **A01N** *9/20*

U.S. Cl. 424—322 **11 Claims**

1. An N-phenyl-N'-benzoyl-urea of the formula



in which

R is chlorine or fluorine,

R' is chlorine, fluorine or hydrogen, and

R'' is fluorine, chlorine and bromine.

10. A method of combating the insect *Plutella Maculipennis* which comprises applying to said insect or its habitat an insecticidally effective amount of a compound according to claim 1.

4,085,227

LONG-LASTING FLAVORED CHEWING GUM

Donald A. M. Mackay, Pleasantville; Frank Witzel, Spring Valley, both of N.Y.; Basant K. Dwivedi, Hopatcong, and Daniel Schoenholz, Basking Ridge, both of N.J., assignors to Life Savers, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 577,589, May 15, 1975, and Ser. No. 577,590, May 15, 1975. This application May 4, 1976, Ser. No. 683,107

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 **32 Claims**

1. A flavored chewing gum having a prolonged sweet taste comprising gum base; and from about 0.02 to about 1.0% by weight of a particulate artificial sweetener having an average particle size below about 150 microns dispersed in said gum base, said sweetener being the free acid form of saccharin.

4,085,228

PREPARATION OF PIZZA CHEESE

George W. Reinbold, Wheat Ridge, and Malireddy S. Reddy, Thornton, both of Colo., assignors to Leprino Cheese Co., Denver, Colo.

Filed Aug. 18, 1976, Ser. No. 715,577

Int. Cl.[2] A23C *19/02*

U.S. Cl. 426—36 **16 Claims**

1. The process of manufacturing low-moisture Mozzarella cheese, including the steps of inoculating a batch of pasteurized cow's milk with a starter culture comprising from 1 to 3% based on the weight of the milk batch of *S. thermophilus* together with Lactobacillus selected from *L. bulgaricus, L. helveticus,* or both *L. bulgaricus* and *L. helveticus,* making cheese curd from the thus-inoculated milk including cooking the curd at 100° to 125° F., mixing and stretching the curd in water at a temperature above 130° F. to impart a stringy texture to the cheese, molding the mixed curd into bodies, and salting the molded bodies, wherein the improvement comprises: also inoculating said milk batch before making the cheese curd with from 0.5 to 3.0% based on the weight of the milk batch of an additional viable culture selected from cultures of *Pediococcus cerevisiae, Lactobacillus plantarum, Streptococcus faecalis, Streptococcus durans,* and *Lactobacillus casei,* and at the conclusion of said process holding the salted cheese bodies at a non-freezing temperature below 55° F. for 5 to 30 days while reducing the residual lactose sugar content of the cheese, said holding being continued until said cheese bodies have an average lactose sugar content below 0.3%.

4,085,229

PROCESS FOR THE TREATMENT OF CAKES AND SEEDS OF VEGETABLE ORIGIN

Thadée Joseph Staron, Noisy le Roi (Yvelines), France, assignor to Institut National de la Recherche Agronomique, Paris, France

Filed May 6, 1976, Ser. No. 684,031

Claims priority, application France, May 12, 1975, 75 14676

Int. Cl.[2] C12D *13/06;* **A23L** *1/20*

U.S. Cl. 426—46 **21 Claims**

1. A process for the treatment of cakes and seeds of vegetable origin involving the action of a microorganism, comprising the steps of:

(a) subjecting said cakes or seeds, to the action of at least one microorganism selected from the yeasts and fungi capable of hydrolyzing the polysaccharides and toxic impurities without peptonizing the proteins under maceration conditions to effect digestion,

(b) separating the insoluble products from the reaction medium,

(c) solubilizing the proteins contained in said insoluble products by means of an alkali in the presence of a reducing agent,

(d) acidifying the protein solution obtained in step (c) to a pH of about 4.5 to 5.5 to coagulate the proteins at their isoelectric point.

4,085,230

PROCESS FOR PRODUCING A ROASTED PEANUT PRODUCT

William M. Green, P.O. Box 807, Robersonville, N.C. 27871

Filed Mar. 6, 1974, Ser. No. 448,666

Int. Cl.[2] A23L *1/36*

U.S. Cl. 426—262 **7 Claims**

1. The process of preparing a roasted peanut product comprising: removing the shells and skins from raw peanuts; pre-

cooking said peanuts over a period of from about 4 to 12 minutes in a water solution which contains from between about 0.02 to 1.0 percent by weight of a reducing sugar and wherein said water solution is maintained at a temperature in the range of from about 190° to 212° F. throughout said precooking operation; removing said peanuts from said hot precooking cooking solution and eliminating excess water from the exterior of such peanuts; roasting said peanuts in a bath of hot edible oil for a period of 3 to 8 minutes at a temperature ranging from 320° to 380° Fahrenheit; removing said roasted peanuts from said oil bath and draining excess oil therefrom; cooling said peanuts to approximate ambient temperature; coating said peanuts with a liquid edible oil or fat ranging from 1 to 3 percent by weight of the peanuts; salting said peanuts to impart a favorable flavor thereto; and packaging said peanuts whereby a superior roasted peanut product is produced.

4,085,231

CONTAINER EVACUATION PROCESS

Joseph F. R. Weston, Peabody, Mass., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 8, 1976, Ser. No. 731,065
Int. Cl.[2] B65B *31/04*
U.S. Cl. 426—410 **10 Claims**

1. A process for removing a gaseous fluid from a flexible container, said container having an article therein and being comprised of a body portion and a neck portion communicating with and defining a single opening in said container, said process comprising the steps of:

(a) placing the opening of said container within a nozzle, so as to leave a space between the neck of the said container and said nozzle, while substantially maintaining the portion of said container surrounding said article on the exterior of said nozzle; and

(b) forcing fluid on the exterior of said container to flow from the exterior of said nozzle through said space and into said nozzle at a velocity sufficient to cause said gaseous fluid within said container to be withdrawn from said container through said opening and into said nozzle.

4,085,232

NEOHESPERIDINE DIHYDROCHALCONE SWEETENING COMPOSITIONS

Marvin E. Eisenstadt, Neponsit, N.Y., assignor to Cumberland Packing Corporation, Brooklyn, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,269
Int. Cl.[2] A23L *1/236*
U.S. Cl. 426—548 **5 Claims**

1. A sweetening composition consisting essentially of (a) a dihydrochalcone derivative selected from the group consisting of neohesperidine dihydrochalcone, naringin dihydrochalone and salts thereof in an amount of about 0.25–4% by weight, (b) a vanilla flavor in an amount of about 0.25–3% by weight (c) cream of tartar in an amount of about 0.5–4% by weight, and (d) a sugar in an amount of about 89–99% by weight.

4,085,233

FOOD PRODUCT MADE FROM MUSHROOM STUMPS AND METHOD FOR MANUFACTURING THE SAME

Alan S. Turover, San Jose, Calif., assignor to Castle & Cooke, Inc., San Jose, Calif.

Filed Feb. 1, 1977, Ser. No. 764,703
Int. Cl.[2] A23L *1/00, 1/22*
U.S. Cl. 426—615 **11 Claims**

1. A process for making a useful food product from mushroom stumps comprising,

removing loose dirt from the dry stumps,

washing the cleaned stumps with water under pressure to remove further dirt,

breaking down the stumps to small particle size to form a puree,

separating the remaining dirt from the puree,

pasteurizing the puree, and

concentrating the pasteurized puree.

4,085,234

PROCESS FOR MANUFACTURING FAST COOKING RICE

Hidemoto Kamada, Tokyo; Chiaki Miura, and Etsuo Kano, both of Kawasaki, all of Japan, assignors to Calpis Shokuhin Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,579
Claims priority, application Japan, Jul. 16, 1975, 50-86157
Int. Cl.[2] A23L *1/182*
U.S. Cl. 426—618 **8 Claims**

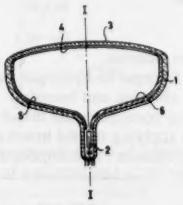
1. A process for the manufacture of fast cooking rice, consisting essentially of puffing raw rice into a puffed rice having a volume of 6 to 16 times as large, contacting said puffed rice with a solution of at least one thickener susceptible to gelling by metallic ions, in a concentration of about 0.2 to about 3.0% by weight sufficiently to penetrate to the inside center of the puffed rice, then contacting said rice with a solution of said metallic ions to thereby gell said thickener and subsequently drying the treated puffed rice whereby it is reduced in volume.

4,085,235

METHOD OF MANUFACTURING A CATHODE-RAY TUBE

Johannes Maria Azalina Antonius Compen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 10, 1976, Ser. No. 740,256
Claims priority, application Netherlands, Nov. 19, 1975, 7513490
Int. Cl.[2] H01J *29/88*
U.S. Cl. 427—64 **9 Claims**



1. A method of forming an electrically conductive layer on an internal wall portion of a cathode-ray tube envelope, said method comprising the steps of:

applying to said wall portion a coating of an aqueous suspension comprising an electrically conducting material, a binder from the group consisting of alkali metal silicate and nitrocellulose, and one or a mixture of more than one alkali carbonate from the group consisting of sodium carbonate and potassium carbonate, the total quantity of alkali carbonate being between approximately 3% and

30% by weight of the total weight of suspended and dissolved solids in said suspension;
drying said suspension on said wall portion; and
firing said envelope.

4,085,236

PROCESS FOR PRODUCING ELECTROSTATIC RECORDING MATERIAL

Yoshiyuki Ishibashi; Eijiro Tagami, both of Yokkaichi; Taiji Higaki, Nishinomiya, and Takao Matsushita, Kobe, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd. and Kanzaki Paper Manufacturing Co., Ltd., both of, Japan

Filed Jul. 16, 1976, Ser. No. 705,820
Claims priority, application Japan, Jul. 28, 1975, 50-91073
Int. Cl.[2] B05D *5/12;* **G03G** *5/00*
U.S. Cl. 427—121 **25 Claims**

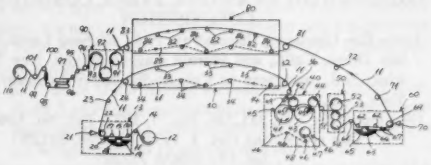
1. A process for producing an electrostatic recording material which comprises kneading a hydrophobic pigment having a critical surface tension of 50 dynes/cm or less with an aqueous dispersion of a copolymer consisting of (I) 10 to 50% by weight of methacrylic acid, (II) 5 to 50% by weight of an alkenyl aromatic compound and (III) 30 to 85% by weight of at least one member selected from the group consisting of conjugated diolefins, alkyl acrylates, and alkyl methacrylates; having a glass transition temperature (Tg) of 40° C or less; and having an intrinsic viscosity [η] of 0.1 to 1.0 dl/g as measured in tetrahydrofuran at 25° C, in a weight ratio of the copolymer to the pigment of 100/20 to 100/200, in the presence of an alkaline material in such a proportion that the viscosity of the aqueous dispersion of the copolymer becomes at least 350 cps, adjusting the viscosity of the aqueous dispersion containing the copolymer and the hydrophobic pigment to 10 to 5,000 cps, coating the resulting coating composition on the surface of an electroconductive base sheet and drying the same.

4,085,237

METHOD AND APPARATUS FOR MANUFACTURING PRESSURE SENSITIVE COPYING SHEET

Takajiro Kawakami; Minesilo Mizuno; Akira Okushi, and Michio Yasuda, all of Amagasaki, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1975, Ser. No. 613,508
Claims priority, application Japan, Sep. 17, 1974, 49-107317; Sep. 20, 1974, 49-108981
Int. Cl.[2] B41M *5/22;* **B05C** *9/04, 9/14*
U.S. Cl. 427—150 **6 Claims**



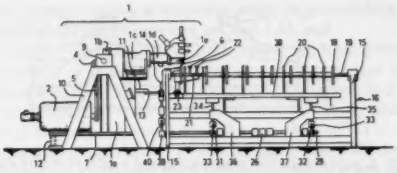
1. In a method for manufacturing a pressure sensitive copying sheet having an acceptor coating on one side and a color former coating on the opposite side, the steps, in the sequence set forth, of coating an acceptor composition on one side of a continuously fed paper sheet, drying the paper sheet coated with said acceptor composition, cylinder ironing said paper sheet to remove wrinkles, calendering the dried sheet with a calender comprising at least one pair of rolls, one of said pair of rolls being a metal roll and the other being an elastic roll having a Shore hardness within the range of 65 to 90, coating a color former composition on the other side of said paper sheet, drying the paper sheet coated with said color former composition.

4,085,238

PROCESS AND APPARATUS FOR APPLYING PLASTIC FILAMENTS TO SHEETS FOR MULTIPLE PANE WINDOWS

Pierre Chenel, Enghien Les Bains, and Joel Vachet, Baudrieres, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Dec. 11, 1975, Ser. No. 639,788
Claims priority, application France, Dec. 11, 1974, 74 40825
Int. Cl.[2] C03C *27/00;* **B25J** *3/00*
U.S. Cl. 427—207 A **12 Claims**



1. A process for applying an intermediate filament of plastic material along the edges and at the corners of a transparent or translucent sheet used in producing a multiple pane window, said process comprising:

a. moving a face surface of the sheet on a conveyor past an extrusion nozzle while depositing a substantially continuous plastic filament on the face surface of the sheet adjacent a first edge thereof;
b. interrupting the relative movement of the sheet and the deposit of said plastic filament when a corner of the sheet is reached;
c. moving the extrusion nozzle and the sheet away from the conveyor and moving the extrusion nozzle relative the face of the sheet at the corner to detach a short distance of said plastic filament without breaking continuity of the plastic filament and thereafter;
d. turning the sheet in the plane of the face thereof relative the extrusion nozzle;
e. returning the extrusion nozzle and sheet to depositing position; and
f. moving the face surface of the sheet past the extrusion nozzle while depositing said plastic filament along a second edge of the sheet.

3. An apparatus for applying an intermediate filament of plastic material along the edges and at the corners of a transparent or translucent sheet used in producing a multiple pane window, said apparatus comprising in combination:

a. an extrusion device having means for extruding a substantially continuous plastic filament on the face surface of the sheet adjacent a first edge thereof;
b. a conveyor for moving the sheet past the extrusion nozzle while depositing said plastic filament on the face surface of the sheet adjacent a first edge thereof;
c. means for interrupting the relative movement of the sheet and the deposit of said plastic filament when a corner of the sheet is reached;
d. means moving the extrusion nozzle and means moving the sheet away from the conveyor, said means for moving the extrusion nozzle separating the extrusion nozzle relative to the face of the sheet at the corner to effect detachment of a short distance of said plastic filament without breaking continuity of the plastic filament;
e. means for turning the sheet in the plane of the face thereof relative the extrusion nozzle about an axis adjacent the corner of the sheet; and
f. means for returning the extrusion nozzle and sheet to said conveyor for moving the sheet past the extrusion nozzle while depositing said plastic filament along a second edge of the sheet.

4,085,239

PROCESS FOR MANUFACTURING A DIFFERENTIALLY EXPANDED RESINOUS CELLULAR SHEET

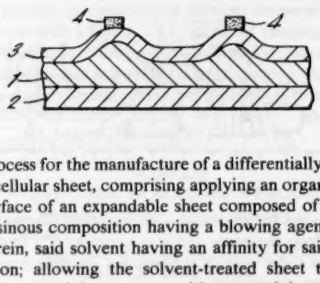
Rodney John Briston, Blackburn; Rodger George Canning, Chorley, and John Parker Tomlinson, Darwen, all of England, assignors to Reed International Limited, London, England

Filed Mar. 9, 1977, Ser. No. 775,883

Claims priority, application United Kingdom, Mar. 10, 1976, 9557/76

Int. Cl.[2] B05D *3/02, 5/02*

U.S. Cl. 427—208 11 Claims



1. A process for the manufacture of a differentially expanded resinous cellular sheet, comprising applying an organic solvent to the surface of an expandable sheet composed of a thermoplastic resinous composition having a blowing agent incorporated therein, said solvent having an affinity for said resinous composition; allowing the solvent-treated sheet to at least partially dry; applying a composition containing a metallic powder and a kicker for the blowing agent to portions of the solvent-treated surface, adhesion of the metallic powder composition to said sheet being enhanced by the solvent treatment; and then uniformly heating the treated sheet for a time and at a temperature at which the blowing agent decomposes in the presence of the kicker but below that at which it decomposes in the absence of the kicker so that those portions of the sheet which received an application of metallic powder and kicker containing composition expand to a greater extent than those portions which did not receive an application of metallic powder and kicker containing composition to produce said differentially expanded sheet.

4,085,240

PROCESS FOR IMPROVING THE ADHESION OF COATINGS OF VULCANIZED EPDM ARTICLES

Helmut Scharf, Schermbeck, Germany, assignor to Chemische Werke Huels, A.G., Marl, Germany

Filed Aug. 24, 1976, Ser. No. 717,461

Claims priority, application Germany, Aug. 28, 1975, 2538218

Int. Cl.[2] B05D *1/36, 7/02*

U.S. Cl. 427—302 8 Claims

1. A process which comprises the steps of applying to the surface of an article formed from a vulcanizate of a 30–89.5% by weight ethylene — 69.5–10% by weight α-olefin - 0.5–10% by weight unconjugated diene terpolymer elastomer and at least 30 parts by weight of carbon black filler per 100 parts by weight of elastomer, a compound having a functional group reactive with isocyanates, said compound being of the general formula RX wherein R is linear or branched alkyl, alkenyl, alkylaryl, alkenylaryl, alkylcycloalkyl, alkenylcycloalkyl, alkylcycloalkenyl or alkenylcycloalkenyl of 4–20 carbon atoms in the primary chain and up to 20 carbon atoms in the side chains, and X is $-NH_2$, $-NHR'$, $-CONH_2$, $-NHCONH_2$, $-NHCOOR'$, $-OH$, $-SH$, $-SO_3H$, $-OCOCH_2COOR'$, $-COOCH_2CHOHCH_2OH$, $-COOCH_2CH_2OH$ or $-COOH$ wherein R′ is methyl or ethyl, thereby rendering the surface more adhesible to isocyanate-cross-linked polyester coatings, and then applying an isocyanate cross-linked polyester coating to the thus-treated article.

4,085,241

INORGANIC-ORGANIC SEPARATORS FOR ALKALINE BATTERIES

Dean W. Sheibley, Sandusky, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 7, 1976, Ser. No. 720,521

Int. Cl.[2] H01M *3/02*

U.S. Cl. 427—385 B 17 Claims

1. A method of making a flexible, porous, separator for an alkaline EMF cell comprising the steps of:

dissolving in a solvent a thermoplastic rubber of the type made up of chains of 3-blocks wherein the middle block is an elastomer and each end block is thermoplastic;

mixing a first filler material inert to said alkaline electrolyte and a second-pore forming filler material reactive with said alkaline electrolyte;

combining the filler materials and the dissolved thermoplastic rubber to form a slurry;

coating said slurry on a flexible non-metallic substrate; and

drying said coating.

4,085,242

METHOD OF COATING WITH LIQUID AMINOPLAST POLYFUNCTIONAL RESIN COMPOSITIONS

Frank J. Hahn, Wilbraham, and James O. Santer, East Longmeadow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 572,037, Apr. 28, 1975, Pat. No. 4,031,057. This application Apr. 11, 1977, Ser. No. 786,173

Int. Cl.[2] B05D *3/02;* B32B *27/42*

U.S. Cl. 427—385 R 5 Claims

1. A process for coating an article which comprises blending a N,N′-bis(alkoxymethyl) uron and a polyfunctional resin in the weight ratio in the range of 30 to 70 to 70 to 30 to form a homogeneous solution, applying a film of the solution to a surface of the article, and baking the article at a temperature sufficient to thermoset the solution, wherein the alkyl radicals of the alkoxy groups of the uron are selected from the group consisting of C_1 to C_6 alkyl radicals, and wherein the polyfunctional resin contains sufficient alcoholic hydroxyl and carboxyl groups to provide a functionality greater than 2 and has a number average molecular weight in the range of 300 to 5000, and wherein the solution viscosity at 25° C. is less than 1000 centipoises.

4,085,243

METHOD OF TREATING A FABRIC PRIOR TO IRONING WITH AN ANIONIC FABRIC CONDITIONING COMPOSITION

Annie Sue Giordano, Piscataway, N.J.; Richard Lerda Burke, San Diego, Calif., and Harold Eugene Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 311,720, Dec. 7, 1972, Pat. No. 3,965,014. This application Oct. 3, 1974, Ser. No. 511,897

Int. Cl.[2] D06M *13/20*

U.S. Cl. 427—387 3 Claims

1. A method of softening fabrics and imparting soil release characteristics thereto as an aid to ironing, comprising treating said fabric prior to said ironing with a composition comprising a dimethypolysiloxane polymer, water, and about 0.5 to 10% by weight of an anionic surfactant having a derivable pH of about 7–9 selected from the group consisting of alkyl benzene sulfonates wherein the alkyl group contains from about 10 to about 20 carbon atoms, alkyl toluene sulfonates wherein the alkyl group contains from about 10 to about 20 carbon atoms, ethoxylated alcohol sulfates produced from an aliphatic alcohol having from about 10 to about 20 carbon atoms ethoxylated with from about 1 to about 6 moles of ethylene oxide, soaps of fatty acids having from about 10 to about 20 carbon

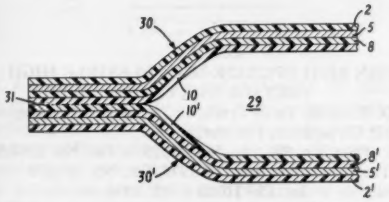
atoms, paraffin sulfonates having from about 10 to about 20 carbon atoms, N-(2-hydroxyalkyl)-amino acids having from 10 to 20 carbon atoms in the alkyl chain, and mixtures thereof, said composition drying on said fabrics.

3. An aerosol fabric softening and soil release product comprising the composition as defined in claim 1 and an effective amount of an aerosol propellant.

4,085,244
BALANCED ORIENTATED FLEXIBLE PACKAGING COMPOSITE

Nathan Stillman, Walnut Creek, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 10, 1976, Ser. No. 656,863
Int. Cl.² B32B *3/02*
U.S. Cl. 428—192 **10 Claims**



1. A composite, flexible packaging film comprising essentially a first layer of balanced biaxially-oriented polyamide, providing substantially flex-crack resistance, affixed to one side of a second layer of flexible metal foil and a third layer of balanced biaxially-oriented polypropylene, also providing substantially flex-crack resistance, affixed to the opposite side of said foil and to a fourth layer of heat-sealable polyolefin.

4,085,245
TRANSPARENCIES FOR COLOR XEROGRAPHIC COPIES

Michael G. De Vito, Macedon, and Francis J. Wieloch, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,341
Int. Cl.² B32B *5/16, 5/30, 27/06*
U.S. Cl. 428—215 **13 Claims**

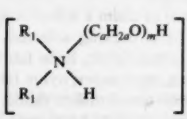
1. A transparency for use in electrostatographic copying which comprises:

a) a base layer of a transparent, heat stabilized polyester sheet,

b) a second layer adherent to the surface of said polyester sheet of a mixture of an acrylic polymer and a copolymer of vinyl acetate and vinyl chloride said layer having uniformly dispersed therein:

i. particulate silica having a mean particle size of from about 2 to 70 millimicrons in its longest dimension and being present in an amount of from about 0.25 to about 1.5 weight percent of said second layer, and

ii. an anti-static agent of a salt formed from an anion of a carboxylic acid having 1 to 37 carbon atoms or a dimeric fatty acid having 12 to 36 carbon atoms and a cation characterized by the formula:



wherein R_1 is a saturated straight chained or branched chain aliphatic hydrocarbon radical of 3 to 24 carbon atoms, a is 2 or 3 and m is a number from 2 to 40.

4,085,246
SIMULATED GRANITE AND ITS PREPARATION

Kenneth Rene Buser; Milton John Roedel, both of Wilmington, and Eustathios Vassiliou, Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 18, 1975, Ser. No. 588,008
Int. Cl.² C08K *3/00, 5/00*
U.S. Cl. 428—220 **39 Claims**

1. A simulated granite article comprising:

A. about 35 to 95% by volume (based on total granite volume) of a matrix comprising:

(1) at least 34% by volume (based on total granite volume) of polymer having a refractive index (n_D) according to ASTM-(D542)27 between 1.4 and 1.65, and

(2) about 1 to 50% by volume (based on total granite volume) of filler having a maximum particle size less than about 100 microns in the longest dimension and an amorphous or mean crystalline axial refractive index (n_D) between 1.4 and 1.65; in such a ratio of (1) to (2) that the optical density to visible light (4000–8000 Angstroms) of a 0.01 inch thick film of the matrix is less than 1.5;

B. about 0.1 to 50% by volume (based on total granite volume) of randomly distributed opaque particles having a minimum particle size greater than 200 microns in shortest dimension and an optical density to visible light (4000–8000 Angstroms) greater than 2.0; and

C. about 0.1 to 50% by volume (based on total granite volume) of randomly distributed translucent particles, transparent particles or both having a minimum particle size greater than 200 microns in shortest dimension, and an optical density to visible light (4000–8000 Angstroms) less than 2.0; in such a ratio of (A) to (B) to (C) that the optical density to visible light (4000–8000 Angstroms) of a 0.05-inch thick wafer of the article is less than 3.0.

4,085,247
FIRE-PROTECTING EPOXY RESIN REINFORCED WITH GLASS FIBER

Leo M. Godfried, Badhoevedorp, Netherlands, assignor to Fokker-VFW B. V., Schiphol-Oost, Netherlands

Division of Ser. No. 488,007, Jul. 12, 1974, Pat. No. 3,981,832, which is a division of Ser. No. 220,431, Jan. 24, 1972, Pat. No. 3,839,239. This application Jul. 2, 1976, Ser. No. 702,203
Int. Cl.² B27K *3/00*
U.S. Cl. 428—290 **6 Claims**

1. A fire-protecting sandwich panel, comprising a core of foam material and skin sheets of glass fiber mats impregnated with a fire-protecting epoxy resin,

said fire-protecting epoxy resin essentially comprising a cured product of an epoxy resin made from a polyfunctional halohydrin and a polyhydric phenol and cured with a curing agent selected from the group consisting of polyamines, and carboxylic anhydrides, said cured epoxy resin having a source of carbon, a source of phosphoric acid and a source of non-inflammable gases incorporated therein throughout its mass,

said source of carbon having a high temperature of decomposition and containing many radicals capable of entering into an esterfying reaction with phosphoric acid, said carbon source being polyvalent alcohol,

said source of phosphoric acid being a phosphate compound having a selected decomposition temperature lower than that of said source of carbon to generate phosphoric acid whereby said esterfying reaction may take place at said selected temperature and being selected from the group consisting of ammonium orthophosphate, melamine phosphate, polyphosphoryl phosphate, and water-insoluble ammonium polyphosphate with a phosphate content of about 90% and said source of non-inflammable gases being a compound which does not take part in the curing of the epoxy resin but remains in free state therein and provides non-inflammable gases at temperatures above

said selected temperature and said source of non-inflammable gases being selected from the group consisting of dicyanodiamide, urea, melamine, guanidine and a combination thereof with chlorinated paraffin.

4,085,248

METHOD TO APPLY A PROTECTIVE LAYER TO THE SURFACE OF OPTICAL REFLECTORS, AND SO-MADE REFLECTORS, PARTICULARLY AUTOMOTIVE VEHICLE HEAD LAMPS

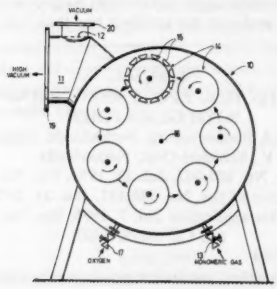
Ernst Zehender, Ottenbronn; Bernhard Blaich, Stuttgart; Helmut Stein, Ditzingen, and Karl Kerner, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 20, 1976, Ser. No. 716,107

Claims priority, application Germany, Aug. 22, 1975, 2537416; Jun. 5, 1976, 2625448

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—336 **52 Claims**



1. Method to apply a protective layer to the surface of optical reflectors in an evacuated vacuum vessel (**10**) comprising the steps of

locating an electron emissive wire (**16**) in said vessel,

locating a mass of reflecting metal in said vessel,

locating reflector substrates (**15**) in said vessel,

heating said mass of reflecting metal to the evaporation temperature of said reflecting metal to vaporize said metal and deposit a thin reflective layer of said metal on said reflector substrates, then

exposing the metal coated reflector substrates to an organic monomeric gas,

generating electrons by heating said electron emissive wire (**16**) to a temperature sufficiently high to emit electrons and biassing said wire (**16**) to a negative voltage with respect to said reflector substrates (**15**) thereby polymerizing the gas at the surface of the substrate to form a protective hydrophobic polymer layer from said monomer by polymerization from the gas phase by exposure to

electrons generated by thermal emission from said heated electron emissive wire.

4,085,249

SEMICONDUCTIVE COMPOSITION HAVING CONTROLLED STRIPPABILITY

Seiho Taniguchi; Yoichi Kawasaki, and Shin' Ichi Sugawara, all of Yokohama, Japan, assignors to Nippon Unicar Company Limited, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 640,796

Claims priority, application Japan, Dec. 20, 1974, 49-145603

Int. Cl.[2] H01B *3/44*

U.S. Cl. 428—383 **10 Claims**

1. A semiconductive composition comprising chlorinated ethylene-vinyl acetate copolymer,

said copolymer containing about 3 to 40 weight percent of chlorine and having a vinyl acetate content of about 15 to 50 percent by weight,

and sufficient amounts of electrically conductive carbon black as to render said composition semi-conductive.

4,085,250

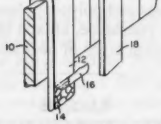
RESIN RICH EPOXIDE-MICA FLEXIBLE HIGH VOLTAGE INSULATION

James D. B. Smith, Turtle Creek, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 591,244, Jun. 27, 1975, Pat. No. 3,998,983. This application Aug. 24, 1976, Ser. No. 717,078

Int. Cl.[2] H01B *3/40, 3/04*

U.S. Cl. 428—418 **9 Claims**



1. A flexible, void-free, high voltage capability, mica insulation sheet material, consisting essentially of mica and a contacting polymerizable, flexible, dry resinous composition consisting of a homogenous mixture of an epoxide resin and an amount of organo-titanate compound effective to cure the epoxide at temperatures of at least about 140° C; wherein the epoxide resin contains from about 95 to 99 weight percent solids and the organo-titanate compound is selected from the compounds having the structural formula $Ti(OR)_4$, wherein each R group is independently selected from the group consisting of alkyl groups having 1 to 10 carbon atoms, aryl group, Cl, Br or NO_2 substituted aryl groups, alkaryl groups with the alkyl constituent having from about 1–10 carbon atoms, Cl, Br or NO_2 substituted alkaryl groups with the alkyl constituent having from about 1–10 carbons, alkaryl groups with the alkyl constituent having from about 1–10 carbon atoms, cyclopentane groups, cyclopentene groups, cyclopentadiene groups, cyclohexane groups, cyclohexene groups and cyclohexadiene groups and wherein the organo-titanate contacts mica causing the organo-titanate to act as a latent catalyst, said resinous composition being capable of fusion upon heating to form a cured, inflexible material.

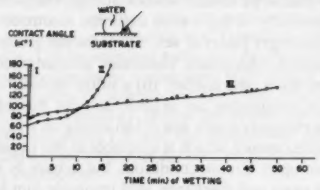
2. The sheet material of claim **1** wherein the mica insulation sheet is, supported by a backing selected from the groups consisting of paper, cotton fabric, linen fabric asbestos paper, glass cloth, glass fibers, mica paper, nylon fabric, polyethylene fabric and polyethylene terephthalate fabric.

8. The sheet material of claim **2** wrapped around an electrical conductor selected from the group consisting of copper and aluminum and cured at a temperature of at least about 140° C.

4,085,251
HIGH RETENTION WOOD PRESERVATIVE COMPOSITION

Jaromir R. Rak, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 417,404, Nov. 19, 1973, abandoned. This application Feb. 12, 1976, Ser. No. 657,398
Int. Cl.[2] B05D 3/02, 1/18; B32B 9/04, 23/08
U.S. Cl. 428—485 16 Claims



1. A method of increasing and prolonging the immobilization of preservative in wood on treating wood with deeply penetrating wood preservative solutions said penetrated preservative tending to migrate and become depleted on prolonged service, comprising:

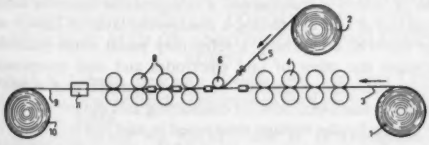
a. incorporating in the wood preservative solution in a deeply penetrating organic solvent (i) a hydrophobic agent selected from the group consisting of fatty acids and their esters, fatty alcohols and paraffin waxes in amounts of from about 0.5% up to about 5% weight/volume based on the solution, said fatty acids and alcohols having at least 10 carbon atoms in the molecule; and (ii) an amorphous vinylic-type polymer in amounts of at least about 0.2% w/v up to about 1% w/v based on the solution, said polymer being soluble in the solution; and

b. penetrating the wood with the modified preservative solution said modified solution having deep penetrability substantially equivalent to that of the initial solution and evaporating the solvent to leave a clean wood surface.

4,085,252
COMPOSITE WIRE WITH A BASE OF CERIUM AND OTHER RARE EARTHS

Pierre Karinthi, Jouy-en-Josas; Michel Dauvergne, Osny, and Benoît Hirschauer, Pontoise, all of France, assignors to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 16, 1976, Ser. No. 677,545
Claims priority, application France, Apr. 18, 1975, 75 12060
Int. Cl.[2] B23P 3/00; C21C 7/00; B21F 19/00
U.S. Cl. 428—576 8 Claims

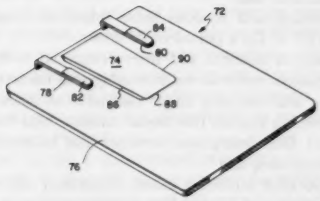


1. A composite wire having a core formed of at least one rare earth element, said core being enclosed inside a metallic casing and having a diameter *d* between 1.4 and 8.5 mm. tightly enclosed by said metallic casing, said casing having a thickness *e* between 0.1 and 1 mm., wherein *e* is greater than 0.04 *d* and less than 0.2 *d*.

4,085,253
BATTERY ASSEMBLY

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 581,113, May 27, 1975, Pat. No. 4,041,514.
This application Jan. 21, 1977, Ser. No. 761,063
Int. Cl.[2] H01M 2/10
U.S. Cl. 429—1 4 Claims



1. A battery assembly adapted to be releasably attached to a camera of the type having means in an exterior surface thereof for receiving at least a portion of the battery assembly and a pair of electrical contacts for engagement with a pair of terminals on the battery assembly, said battery assembly comprising:

a generally thin flat battery including a pair of battery terminals; and

means extending from said battery for slidably attaching said battery to the camera such that said battery lies substantially flush with the exterior surface of the camera, said extending means being located intermediate said pair of battery terminals and having a tapered configuration which is adapted to be received by the means in the exterior surface of the camera only when a predetermined spatial orientation exists therebetween thereby insuring that said pair of battery terminals are operatively engaged with the electrical contacts when the battery is attached to the camera.

4,085,254
BIOLOGICAL APPARATUS FOR GENERATING ELECTRICAL POWER AND PROCESS FOR PRODUCING BACTERIA ELECTROLYTE

Lyle D. Atkins, Houston, Tex., assignor to Biolec Corporation, Houston, Tex.

Continuation of Ser. No. 415,324, Nov. 13, 1973, abandoned.
This application Oct. 28, 1975, Ser. No. 625,866
Int. Cl.[2] H01M 8/16
U.S. Cl. 429—2 14 Claims

1. A long-lived, self-contained, bacteria-energized source of electric power, including

a first electrode formed of at least one element of relatively high electromotive force,

a second electrode spaced from said first electrode and formed of a different element of relatively low electromotive force,

an electrolyte comprising an aqueous brine solution containing coexistent quantities of aerobic and anerobic bacteria

derived from marine organisms, produced by the following process steps:

processing a mixture composed of fish stomachs, livers and salt water at 25 psi and 240° F. for one hour,

cooling said processed mixture to ambient temperature and subjecting said mixture to a pressure equivalent to 19 inches of mercury,

extracting from said processed mixture the resultant aqueous brine solution containing coexistent aerobic and anerobic bacteria, and

subjecting said aqueous brine solutio to a temperature of −20° F. for a period of 72 hours,

a bacteria nutrient and filler composed of finely divided cellulose material for sustaining said bacteria and absorbing and carrying all of said aqueous brine solution for insuring that no free liquid remains, said bacteria nutient and filler interposed between and in contact with said electrodes, and

evaporation inhibiting means intermixed with said bacterial nutrient and filler and aqueous brine solution and compatible with said bacteria for inhibiting evaporation of said aqueous brine solution.

4,085,255

WATER SEPARATION CELL FOR REMOVING THE REACTION WATER FROM THE ELECTROLYTE OF FUEL CELLS AND FUEL CELL BATTERIES

Burghard Grave, Erlangen; Heinrich Gutbier, Rottenbach, and Michael Deinzer, Nuremberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 22, 1977, Ser. No. 770,631

Claims priority, application Germany, Mar. 12, 1976, 2610427

Int. Cl.² H01M 8/08

U.S. Cl. 429—26 **9 Claims**

1. In combination with a fuel cell or a fuel cell battery, an improved water separation cell for removing the reaction water from the electrolyte of the fuel cell or fuel cell battery comprising:

a. a vertically extending liquid chamber bounded on at least one side by a porous diaphragm;

b. a gas chamber vertically disposed adjacent said liquid chamber of essentially the same height as said liquid chamber bounded by said diaphragm on one side and by a condensation surface adapted for cooling; and

c. means disposed essentially horizontally dividing said liquid chamber into two chambers of different size which are arranged one on top of the other, the upper chamber being larger than the lower chamber and serving as an electrolyte chamber and the lower smaller chamber acting to take up condensate which passes from said gas chamber through the porous diaphragm into said lower small chamber due to the pressure of a gas present in said gas chamber.

4,085,256

HIGH TEMPERATURE ORGANIC ELECTROLYTE CELLS

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 254,998, May 19, 1972, abandoned. This application Aug. 2, 1976, Ser. No. 710,753

Int. Cl.² H01M 4/48, 4/02

U.S. Cl. 429—48 **4 Claims**

1. A high energy density electrochemical cell having negligible self-discharge characteristics at high temperatures, consisting essentially of (a) a solid cathodic electrode containing active depolarizer material selected from the group consisting of metal oxides, chromates, vanadates, permanganates, molybdates, periodates, and halides, (b) a sulfur dioxide free organic electrolyte comprising an organic solvent having dissolved therein an electrolyte salt, and (c) an anode on which is formed a heat stable coating which is insoluble in the organic electrolyte under open circuit conditions but which is irreversibly dissipated upon cell discharge, said insoluble film having been formed as a reaction product only prior to initial discharge of said cell with an inhibitor gas selected from the group consisting of CO_2, SO_2, O_2, NH_3, and N_2 saturated with respect to water vapor, whereby self discharge of said cell is inhibited until said initial cell discharge.

4,085,257

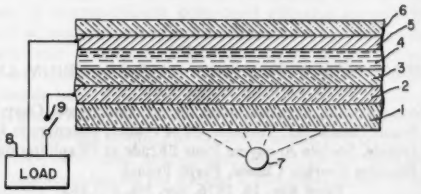
RADIANT ENERGY CONVERTER HAVING STORAGE

Horst Witzke, Princeton, N.J., assignor to Optel Corporation, South Brunswick Township, N.J.

Filed May 30, 1975, Ser. No. 582,344

Int. Cl.² H01M 6/30, 6/36

U.S. Cl. 429—111 **1 Claim**



1. A method of operating an energy conversion and storage device which comprises at least a pair of electrodes, at least one of which is transparent, a compensator layer in contact with one of said electrodes, a transparent layer of charge storage material comprising a refractory metal oxide positioned between the other of said electrodes and said compensator layer, said other electrode being transparent, and means attached to said electrodes for connecting said device to a load to be driven by the voltage developed in said device, the device being characterized by creation of electrons upon irradiation by radiant energy, said created electrons being stored in the charge storage layer, said method comprising the steps of:

1. exposing the device to activating radiation to create electrical charge within said device;

2. storing said charge within said device, and

3. discharging at least a portion of said stored charge through a load.

4,085,258
COMBINATION TYPE STANDARD CELL WITH LOW TEMPERATURE COEFFICIENTS

Kazumi Shimazaki, Mitaka, and Hiroyuki Hirayama, Musashino, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

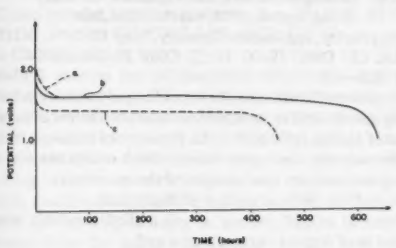
Filed Nov. 19, 1976, Ser. No. 743,358
Claims priority, application Japan, Nov. 22, 1975, 50-139763
Int. Cl.[2] H01M 6/28
U.S. Cl. 429—125 11 Claims

1. A combination-type standard cell comprising three standard cells wherein at least two different types of standard cells selected from the group consisting of Cd standard cells, Cd-Pb standard cells, Cd-Sn standard cells and Sn-Pd-Cd standard cells are combined in serial connection, with two of the three cells in one direction of polarity and the remaining cell in the opposite direction of polarity, so that the overall electromotive force generated is about 1 V and the temperature coefficients of said standard cells offset one another to yield a low overall temperature coefficient.

4,085,259
LIGHT METAL GALVANIC ELEMENT

Helmüt Lauck, Glashutten, Germany, assignor to Varta Batterie Aktiengesellschaft, Germany

Filed Mar. 23, 1976, Ser. No. 669,680
Claims priority, application Germany, Apr. 16, 1975, 2516704
Int. Cl.[2] H01M 4/48
U.S. Cl. 429—194 9 Claims



1. A primary galvanic cell having a negative electrode of light metal, a non-aqueous fluid electrolyte, and a positive electrode and characterized in that:

the positive electrode has a mass having an electro-chemically reducible component consisting mainly of Bi_2O_3, and including additives of about 5 to 30% Sb_2O_3, or about 0.5 to 5% finely divided metallic bismuth, and about 2 to 7% graphite, and about 0.3 to 0.5% polytetrafluorethylene, all by weight, the remainder being substantially all Bi_2O_3, and in that the electrolyte comprises a solution of a conductive salt in a mixture composed primarily of polypropylene carbonate and 1,2 dimethoxyethane.

4,085,260
POWDER COATING COMPOSITIONS WITH HYDROXY CONTAINING ACRYLIC COPOLYMERS-I AND CARBOXYLIC ACID OR ANHYDRIDE CROSSLINKING AGENT

Santokh S. Labana, Dearborn Heights, and Yun Feng Chang, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 526,547, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 407,128, Oct. 17, 1973, abandoned, which is a continuation of Ser. No. 172,223, Aug. 16, 1971, abandoned. This application May 10, 1977, Ser. No. 795,587
Int. Cl.[2] C08F 265/04; C08G 63/12
U.S. Cl. 526—16 10 Claims

1. A powder coating composition which, exclusive of pigments and other nonreactive components, comprises a coreactable mixture of: (A) a copolymer of (i) about 5 to about 20 weight percent of a hydroxy functional monoethylenically unsaturated monomer selected from the group consisting of hydroxyl bearing aliphatic alcohol esters of acrylic or methacrylic acid and (ii) a remainder of monofunctional alpha-beta olefinically unsaturated monomers selected from the group consisting essentially of

(i) acrylates,

(ii) mixtures of acrylates and monovinyl hydrocarbons, and

(iii) mixtures of acrylates, monovinyl hydrocarbons, and modifying monomers selected from the group consisting of vinyl chloride, acrylonitrile, methacrylonitrile and vinyl acetate, said monovinyl hydrocarbons, when included in said copolymer, comprising less than 50 weight percent thereof and said modifying monomers, when included in said copolymer, comprising up to about 35 weight percent thereof,

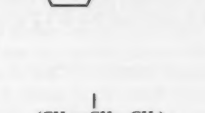
said copolymer having a glass transition temperature in the range of about 40° to about 90° C and a molecular weight ($\bar{M}_n$) in the range of 2,000 to 10,000; and (B) a crosslinking agent selected from the group consisting of organic carboxylic acids and organic carboxylic acid anhydrides in the amount of between about 0.8 and about 1.1 crosslinkable functional groups for each hydroxy group in the copolymer.

4,085,261
ORGANIC REAGENTS AND PROCESS OF PREPARING SAME

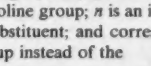
Avraham Patchornik, Ness-Ziona; Abraham Warshawsky, Rehovot; Matityahu Fridkin, Cholon, and Rami Kalir, Rehovot, all of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel

Filed Jan. 29, 1975, Ser. No. 545,220
Claims priority, application Israel, Feb. 8, 1974, 44168
Int. Cl.[2] C08F 212/00, 232/00; C08C 19/00; B01D 11/00
U.S. Cl. 526—19 5 Claims

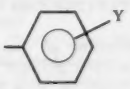
1. A process for preparing a chelating agent useful in organic synthesis and for removing metals, of the formula



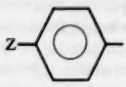
wherein Z is the



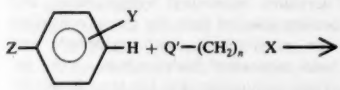
recurring part of a polymeric backbone of a polymer selected from the group consisting of polystyrene a copolymer comprising polystyrene and divinylbenzene, butadiene; and other copolymers comprising styrene; Q is 3-nitro-4-hydroxy-phenyl or an 8 hydroxyquinoline group; n is an integer; and Y is H or a non-interferring substituent; and corresponding compounds with a naphthyl group instead of the

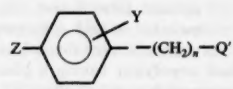


which process comprises chemically binding an activated chemical moiety to a group



wherein Z is as defined above, according to the reaction scheme





wherein Q' is Q as defined above or a functional group which can be converted after such chemical binding to Q, reacting the thus obtained intermediate with aluminum chloride so as to effect a Fries rearrangement and converting the thus obtained intermediate to the corresponding oxime by reaction with hydroxylamine.

4,085,262

PROCESS FOR PRODUCING A HIGH POLYMERIC SUBSTANCE HAVING ISOCYANATE GROUP

Toshio Honda, Akigawa; Itsuo Tanuma, Tokorozawa; Shoji Tanaka, Higashi-Yamato; Koichi Iwami, Kunitachi; Yukio Fukuura, Kodaira; Shoson Shibata, Tokyo, and Yoshikatsu Suzuki, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Nov. 1, 1976, Ser. No. 737,825

Claims priority, application Japan, Oct. 31, 1975, 50-130525

Int. Cl.[2] C08F *8/42, 8/30*

U.S. Cl. 526—46 **14 Claims**

1. A process for producing a high polymeric substance having isocyanate group which comprises:

1. adding potassium or sodium cyanate, and an alkyl hypohalite to a liquid high polymeric substance containing carbon to carbon unsaturated double bond or a solution of said high polymeric substance; and
2. subsequently adding an organic carboxylic acid to the resulting mixture, and reacting the resulting mixture; wherein the amount of said cyanate, said alkyl hypohalite and said organic carboxylic acid, based on one mole of the double bond of said high polymeric substance is 0.05 to 0.5 mole, 0.1 to 0.6 mole and 0.4 to 1.2 mole, respectively.

4,085,263

PROCESS FOR ISOMERIZATION OF LOWER POLYMERS OF BUTADIENE

Yutaka Otsuki; Hirosuke Imai, both of Yokohama; Atsushi Kaiya, Kawasaki, and Hideo Horji, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 391,204, Aug. 24, 1973, abandoned. This application May 15, 1975, Ser. No. 577,930

Claims priority, application Japan, Aug. 25, 1972, 47-85076; Sep. 28, 1972, 47-96613

Int. Cl.[2] C08F *8/42, 8/32*

U.S. Cl. 526—47 **13 Claims**

1. A process for obtaining an isomer having conjugated double bonds of (A) a lower polymer of butadiene or (B) a lower copolymer of butadiene with at least one monomer selected from the group consisting of a conjugated diolefin other than butadiene and a vinyl-substituted aromatic compound, each of (A) and (B) being liquid or semi-solid at room temperature, having a molecular weight of from 300 to 10,000 and having non-conjugated double bonds therein, which comprises contacting a charge consisting essentially of said lower polymer (A) or copolymer (B) at from 0° to 200° C. in the presence of a catalyst comprising (1) an organic alkali metal compound and (2) a diamine compound represented by the formula

wherein *n* is an integer of 2 or 3, and each of R_1, R_2, R_3, R_4, R_5 and R_6 represents a hydrogen atom or an organic compound residual group having from 1 to 20 carbon atoms and any two members of R_1, R_2, R_3 and R_4 may be bonded together to form a cyclic structure,

thereby forming a reaction product containing said isomer, and recovering from said reaction product a product consisting essentially of said isomer.

4,085,264

PROCESS FOR PREPARING COPOLYMERS OF ACRYLIC ACID OR METHACRYLIC ACID AND ACRYLIC AND METHACRYLIC ACID ESTERS

Karl Seib, Weinheim; Wolfgang Schwarz, Ludwigshafen, and Hermann Gausepohl, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 4, 1977, Ser. No. 784,569

Claims priority, application Germany, May 15, 1976, 2621722

Int. Cl.[2] C08C *19/00, 19/22;* C08F *20/04, 220/04*

U.S. Cl. 526—47 **7 Claims**

1. In a process for the manufacture of copolymers by copolymerizing acrylic acid or methacrylic acid with esters of acrylic acid and of methacrylic acid in the presence of initiators which form free radicals, the improvement which comprises copolymerizing — based on total weight of the monomers —

(a) from 45 to 80% of methyl methacrylate,

(b) from 10 to 30% of one or more alkyl acrylates where alkyl is of 3 to 12 carbon atoms and

(c) from 10 to 25% of acrylic acid and/or methacrylic acid at temperatures of from 140° to 300° C, pressures of from 2 to 50 bars and with a monomer residence time sufficient to provide copolymers having molecular weights of from 500 to 4000.

4,085,265

PROCESS FOR ISOMERIZATION OF LOWER POLYMERS OF BUTADIENE

Yutaka Otsuki; Hirosuke Imai, both of Yokohama; Atsushi Kaiya, Kawasaki, and Hideo Horii, Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Division of Ser. No. 577,930, May 15, 1976, Continuation of Ser. No. 391,204, Aug. 24, 1973, abandoned. This application Oct. 29, 1976, Ser. No. 736,950

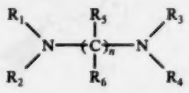
Claims priority, application Japan, Aug. 25, 1972, 47-85076; Sep. 28, 1972, 47-96613

Int. Cl.[2] C08C *19/10;* C08F *8/32, 8/48*

U.S. Cl. 526—49 **6 Claims**

1. A process for obtaining an isomer having conjugated double bonds of (A) a lower polymer of butadiene or (B) a lower copolymer of butadiene, which comprises performing a lower polymerization of butadiene or a lower copolymerization of butadiene with a monomer selected from the group consisting of a conjugated diolefin other than butadiene and a vinyl-substituted aromatic compound with a catalyst selected from the group consisting of an organic alkali metal compound and an alkali metal dispersion the alkali metal thereof forming said organic alkali metal compound, the alkali metal of the catalyst being lithium, sodium or potassium, to form reaction

mixture (i) containing (A) or (B), each of (A) and (B) having non-conjugated bonds therein, adding to said reaction mixture (i) a diamine compound having the formula



wherein n is an integer of 2 or 3, and each of R_1, R_2, R_3, R_4, R_5 and R_6 represents a hydrogen atom or an organic compound residual group having from 1 to 20 carbon atoms, and any two of R_1, R_2, R_3 and R_4 may be bonded together to form a cyclic structure, in the presence or absence of butadiene and any other monomer, and reacting the resulting reaction mixture (ii) at a temperature of from 0° to 200° C., thereby forming a reaction mixture (iii) containing said isomer, and recovering from said reaction mixture (iii) a product consisting essentially of said isomer.

4,085,266

PROCESS FOR THE HIGH PRESSURE PRODUCTION OF POLYETHYLENE

Setsuo Nakai; Shinichiro Kita; Fumihiko Hiki, and Masayuki Shimizu, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 13, 1977, Ser. No. 805,908
Claims priority, application Japan, Jun. 29, 1976, 51-77300
Int. Cl.² C08F *2/02, 4/32, 110/02*
U.S. Cl. 526—65 **6 Claims**

1. In a process for polymerizing ethylene in a two-zone autoclave reactor comprising a top reaction zone and a bottom reaction zone which process comprises polymerizing ethylene in said top reaction zone at 130° to 200° C and at a reaction pressure of 1,000 to 1,800 kg/cm² using an initiator, sending the resulting reaction mixture from the top reaction zone to the bottom reaction zone, and further promoting the polymerization at 220° to 280° C using an initiator which is same as or different from the initiator in the top reaction zone, the improvement which comprises feeding 75% or more of the ethylene to the top reaction zone of the two-zone reactor, said two-zone reactor being constructed so that the volume ratio of top reaction zone to bottom reaction zone is 1.5 to 6 and being provided with two or more feed inlets for each of the ethylene and the initiator in the top reaction zone in the direction extending through the two reaction zones.

4,085,267

PROCESS FOR THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WITH LOW POLYMER BUILDUP

Marion George Morningstar, and Robert Lewis Bowles, both of Avon Lake, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 23, 1976, Ser. No. 660,063
Int. Cl.² C08F *2/20, 2/00, 14/06*
U.S. Cl. 526—74 **16 Claims**

1. A process for preparing vinyl chloride polymer products with substantially no polymer buildup in the reactor which comprises contacting in an aqueous medium in a reactor a mixture comprising (a) vinyl chloride monomer or a mixture thereof with up to about 80% by weight of one or more vinylidene monomers having at least one terminal $CH_2{=}C<$ grouping; (b) a dispersant for the monomer(s); (c) from about 0.0005 weight part to about 0.02 weight part, based on 100 weight parts of monomer(s) of a water-soluble inhibitor in an aqueous caustic solution, said inhibitor being selected from borohydrides having the formula

wherein X is an alkali metal and wherein each of R, R′ and R″ may be hydrogen, phenyl, an alkyl group containing from 1 to 10 carbon atoms, or an alkoxy radical containing from 1 to 10 carbon atoms; and alkali metal nitrites, alkaline earth nitrites, or ammonium nitrite; (d) an oil-soluble, spirit-soluble nigrosine; (e) from about 0.001% by weight to about 1.0% by weight based on the weight of the monomer(s) of an oil-soluble, substantially water-insoluble free radical producing catalyst selected from dialkylperoxydicarbonates wherein the alkyl groups are straight chained or branched and contain from 4 to 14 carbon atoms, adjusting and maintaining the pH of said mixture greater than 7.0, and reacting said mixture at a temperature in the range of about 0° C. to about 100° C. and maintaining the pressure in the range of about 1 to 15 atmospheres throughout the reaction.

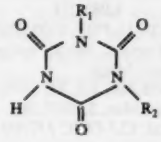
4,085,268

DISUBSTITUTED S-TRIAZINES

William J. Kauffman, Manheim, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 4, 1976, Ser. No. 711,472
Int. Cl.² C07D *251/34*
U.S. Cl. 544—221 **3 Claims**

1. A method of preparing disubstituted s-triazines comprising forming a reaction mixture of an allophanoyl chloride of the formula $R_1NHCON(R_2)COCl$ and an alkali, alkali earth metal or silver cyanate and reacting the said allophanoyl chloride with said cyanate in the presence of a dipolar aprotic solvent at a temperature sufficient to effect the formation essentially of an s-triazine corresponding to the formula



wherein R_1 and R_2 are the same or different and represent a member selected from the group of linear or branched alkyl having from 1 to 18 carbon atoms, linear or branched alkenyl having from 1 to 8 carbon atoms, cycloalkyl having from 5 to 8 carbon atoms in the ring system, phenyl alkyl having from 1 to 4 carbon atoms in the alkyl group, naphthyl alkyl having from 1 to 4 carbon atoms in the alkyl group, C_6 to C_{14} and carbocyclic aryl with the proviso that R_1 and R_2 are not the same when aromatic.

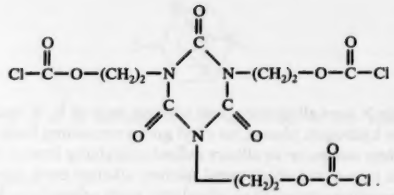
4,085,269

1,3,5 TRIS-(2-CHLOROFORMYL-OXYETHYL)-ISOCYANURATE

Guenther Daumiller, Heidelberg; Karl Merkel, Ludwigshafen; Franz Neumayr, Weisenheim, and Kurt Schneider, Bad Durkheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 27, 1977, Ser. No. 810,274
Claims priority, application Germany, Jul. 27, 1976, 2633685
Int. Cl.² C07D *251/34*
U.S. Cl. 544—221 **1 Claim**

1. Tris-(2-chloroformyl-oxyethyl)-isocyanurate of the formula



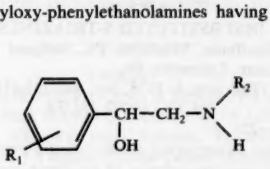
4,085,270

SYMPATHICOMIMETIC ACYLOXY-PHENYLETHANOLAMINE

Dietrich Henschler, Wurzburg; Josef Wagner, Munich, and Hans Hampel, Neukeferloh, all of Germany, assignors to Chemisch-Pharmazeutische Fabrik Adolf Klinge & Co., Munich, Germany

Filed Oct. 13, 1972, Ser. No. 297,416
Claims priority, application Germany, Oct. 19, 1971, 2152058
Int. Cl.[2] C07C *93/20*
U.S. Cl. 560—105 **7 Claims**

1. Mono-acyloxy-phenylethanolamines having the general formula:



wherein

R_1 is pivaloyloxy or phenylacetyloxy in the 3' or 4' position, and

R_2 is methyl or ethyl.

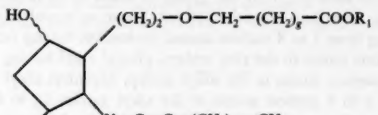
4,085,271

5-OXA-CIS-13-PGF$_1$ COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 595,869, Jul. 14, 1975, Pat. No. 4,026,909. This application Mar. 3, 1977, Ser. No. 774,082
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **25 Claims**

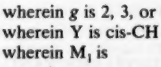
1. A compound of the formula



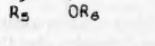
wherein g is 2, 3, or 4;

wherein Y is cis-CH=CH-;

wherein M_1 is

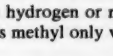


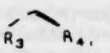
or



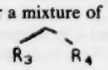
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is





or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein m is one to 5, inclusive; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of 1 to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

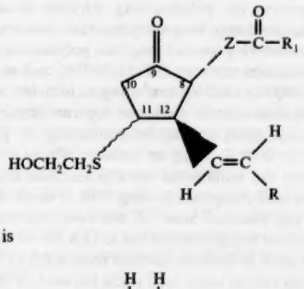
4,085,272

11-(2-HYDROXYETHYLTHIO)PROSTENOIC ACID E$_2$ SERIES DERIVATIVES

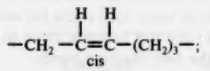
Martin Joseph Weiss, Oradell, N.J., and Gerald Joseph Siuta, Yonkers, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,853
Int. Cl.[2] C07C *177/00*
U.S. Cl. 560—121 **23 Claims**

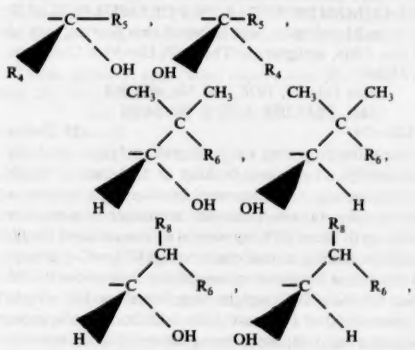
1. An optically active compound of the formula:



wherein Z is



R_1 is selected from the group consisting of hydroxy and C_1-C_6 alkoxy; and R is a moiety selected from the group consisting of



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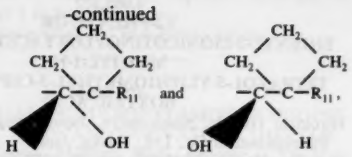
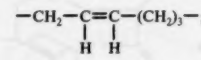


wherein R_4 is selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of C_4–C_7 alkyl and 2-cis(C_4–C_6)alkenyl, R_6 is selected from the group consisting of C_3–C_5 alkyl, R_8 is selected from the group consisting of C_1–C_2 alkyl, and R_{11} is selected from the group consisting of C_3–C_7 alkyl; with the proviso that when R_5 is 2-cis(C_4–C_6)-alkenyl, then R_4 must be hydrogen and Z must be



the racemic mixture thereof; the mirror image thereof; and when R_1 is hydroxy, the pharmaceutically acceptable salts thereof.

4,085,273

PREPARATION OF CHRYSANTHEMIC ACID COMPOUNDS

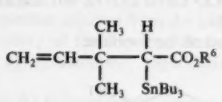
Donald John Peterson, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 586,456, Jun. 12, 1975, Pat. No. 3,998,889, which is a division of Ser. No. 390,156, Aug. 23, 1973, Pat. No. 3,959,324, which is a continuation-in-part of Ser. No. 247,641, Apr. 26, 1972, abandoned. This application Jun. 24, 1976, Ser. No. 699,413

Int. Cl.[2] **C07C** *67/30*

U.S. Cl. 560—124 **1 Claim**

1. A process for preparing chrysanthemic acid esters comprising: (1) admixing an organotin compound of the formula



wherein R^6 is lower alkyl, with an electrophile source of the formula

$CH_3C(O)BF_4$

(2) admixing the product from step (1) with a methylmetallic compound selected from the group consisting of methyl Grignard reagents, methylzinc halides, dimethylmagnesium, and methyl alkali metal compounds; and (3) dehydrating the product from step (2) using iodine catalysis.

4,085,274

PROCESS FOR PREPARING 4-OXOPENTADECANEDIOIC ACID

Katuhiko Takahashi; Kyozo Arimoto; Yoshiyuki Arai; Tsuyoshi Morinaga, and Yuji Nakazawa, all of Ohimachi, Japan, assignors to Daicel Ltd., Sakai, Japan

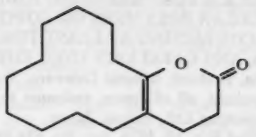
Filed May 26, 1976, Ser. No. 690,360

Claims priority, application Japan, May 30, 1975, 50-65014

Int. Cl.[2] **C07C** *51/34, 67/00*

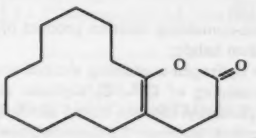
U.S. Cl. 560—176 **2 Claims**

1. A process for preparing 4-oxopentadecanedioic acid which comprises: oxidizing, with ozone, at a temperature of from −80° C to room temperature, a compound having the formula:



said compound being dissolved in an inert organic solvent, to transform said compound to the corresponding ozonide; then adding to the reaction mixture containing said ozonide a basic aqueous solution of a base selected from the group consisting of sodium hydroxide, potassium hydroxide, organic amines, alkali carbonates, ammonia and ammonium hydroxide and a water-soluble organic compound selected from the group consisting of methanol, ethanol and acetone, at from −30° to 0° C, then heating the mixture at reflux to decompose said ozonide and then hydrolyzing to obtain 4-oxopentadecanedioic acid.

2. A process for preparing diester of 4-oxopentadecanedioic acid which comprises: oxidizing, with ozone, at a temperature of from −80° C to room temperature, a compound having the formula:



said compound being dissolved in an inert organic solvent, to transform said compound to the corresponding ozonide; then adding to the reaction mixture containing said ozanide an alcohol selected from the group consisting of methanol, ethanol, isopropyl alcohol and butanol, said alcohol containing a catalytic amount of a strong acid selected from the group consisting of p-toluene sulfonic acid and sulfuric acid, and refluxing the mixture to transform said ozonide to the corresponding diester of 4-oxopentadecanedioic acid.

4,085,275

PRODUCTION OF DI-UNSATURATED CARBOXYLIC ACIDS

James W. Gambell, St. Louis, and H. Burnham Tinker, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 30, 1975, Ser. No. 644,984

Int. Cl.[2] **C07C** *67/30*

U.S. Cl. 560—130 **21 Claims**

1. A process for the production of five carbon chain length or greater alkadienoic acids and esters thereof and alkadienonitriles which comprises contacting reactant compounds having a carboxylic acid or nitrile function of 5 to 10 carbon atoms from the group consisting of alkenoic acids and esters thereof, in which the ester group is stable under the dehydrogenation reaction conditions used in the process, alkenonitriles, hydroxylalkanoic acids and esters thereof, in which the ester group is stable as aforesaid, hydroxynitriles and lactones of hydroxyalkanoic acids with a solid contact catalyst comprising a carbonaceous layer, produced by contacting a solid with organic compounds at high temperatures, effective for the dehydrogenation of methyl hexenoates to methyl hexadienoates at elevated temperatures of about 350° C to 600° C and space velocities in the range of 50 to 5,000 hr^{-1} and diluent to reactant compound volume ratios in the range of 0:1 to about 50:1 or higher.

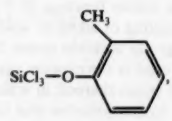
4,085,276
PROCESS FOR PREPARING HIGHLY STEREOREGULAR POLYMERS OR COPOLYMERS OF α-OLEFINS CONTAINING AT LEAST THREE CARBON ATOMS, AND CATALYSTS USED THEREFOR

Akinori Toyota, Iwakuni; Kiyoshi Odawara, Waki, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,980
Claims priority, application Japan, Feb. 14, 1975, 50-17934
The portion of the term of this patent subsequent to Feb. 28, 1993, has been disclaimed.
Int. Cl.[2] C08F 4/02, 10/06
U.S. Cl. 526—122 21 Claims

1. In a process for polymerizing or copolymerizing an α-olefin containing at least 3 carbon atoms or copolymerizing said α-olefin with not more than 10 mole% of ethylene at a temperature of 20° to 200° C. and at a pressure of 1 to 50 kg/cm² in the presence of a catalyst composed of (a) a transition metal catalyst component derived from a solid carrier, an electron donor and a titanium compound and (b) an organometallic compound of a metal of Groups I to III of the Periodic Table, the component (b) being in such amount that the ratio of said metal of Groups I to III/Ti (as metal atom ratio) of the component (a) is 1/1 to 2000/1; the improvement wherein said transition metal component is obtained by reacting the following components (1) and (2):

1. a magnesium-containing reaction product of:
   - i. a magnesium halide;
   - ii. an active hydrogen-containing alcohol selected from the group consisting of C_1 – C_8 aliphatic alcohols, benzyl alcohol, phenethyl alcohol, cumyl alcohol, triphenyl carbinol, o-cresol, m-cresol, 2,6-dimethylphenol and β-naphthol;
   - iii. an organic acid ester selected from the group consisting of an ester formed between C_1 – C_8 saturated or unsaturated aliphatic carboxylic acid which may be substituted by a halogen atom and an alcohol selected from the group consisting of C_1 – C_8 saturated or unsaturated aliphatic primary alcohols, C_3 – C_8 saturated or unsaturated alicyclic alcohols and C_1 – C_4 saturated or unsaturated aliphatic primary alcohols substituted by C_6 – C_{10} aromatic groups or halogen atoms; an ester formed between a C_7 – C_{12} aromatic monocarboxylic acid and an alcohol selected from the group consisting of C_1 – C_8 saturated or unsaturated aliphatic primary alcohols, C_3 – C_8 saturated or unsaturated alicyclic alcohols and C_1 – C_4 saturated or unsaturated aliphatic primary alcohols substituted by C_6 – C_{10} aromatic groups or halogen atoms, methyl cyclopentanecarboxylate, methyl hexahydrobenzoate, ethyl hexahydrobenzoate, methyl hexahydrotoluate and ethyl hexahydrotoluate; and
   - iv. a silicon or tin compound containing at least one halogen atom or hydrocarbon group directly bonded to silicon or tin and selected from the group consisting of $SiCl_3H$, $Sn(C_2H_5)_4$, $SiCl_3(OC_2H_5)$,



silicon tetrahalides, tin tetrahalides, tetraalkyl silicons, silicon alkyl halides, silicon alkyl hydrides, tin alkyl halides and tin hydride halides;

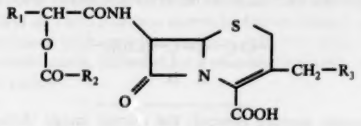
2. a titanium compound of the formula $Ti(OR^1)_nX_{4-n}$ where X is a halogen atom, R^1 is a C_1 – C_4 alkyl group, and n is a number of 0 to 4, the molar ratio of (i)/(ii)/(iii)/(iv)/(2) being 1/(20–0.1)/(20–0.005)/(at least 0.1)/(at least 0.1).

4,085,277
7(2-PHENYL OR THIENYL-2-ISONICOTINOYLOXYACETAMIDO)-3-(1-METHYL-1-H TETRAZOL-5-YL)THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID

Hirokichi Harada, Nishinomiya, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 545,342, Jan. 30, 1975, Pat. No. 4,001,225, which is a continuation-in-part of Ser. No. 476,037, Jun. 3, 1974, Pat. No. 4,000,133. This application Nov. 15, 1976, Ser. No. 742,014
Int. Cl.[2] C07D 501/22, 501/36
U.S. Cl. 544—27 6 Claims

1. A compound of the formula:



wherein
R_1 is phenyl or thienyl,
R_2 is pyridyl, and
R_3 is hydrogen or alkylthio,
and a pharmaceutically acceptable salt thereof.

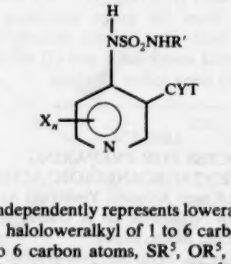
4,085,278
SUBSTITUTED AMINOSULFONYLAMINO PYRIDINE THIOCARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Dec. 6, 1976, Ser. No. 747,671
Int. Cl.[2] C07D 295/10, 401/12, 213/56
U.S. Cl. 544—111 2 Claims

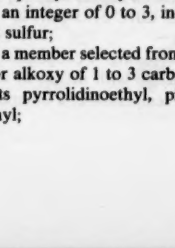
1. A compound of the formulae:

III



and

IV



wherein:
each X independently represents loweralkyl, of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;
n represents an integer of 0 to 3, inclusive;
Y represents sulfur;
T represents a member selected from the group consisting of hydroxy or alkoxy of 1 to 3 carbon atoms;
R′ represents pyrrolidinoethyl, piperidinoethyl or morpholinoethyl;

each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;
R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,085,279

SUBSTITUTED (AMINOSULFONYLAMINO) PYRIDINE CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

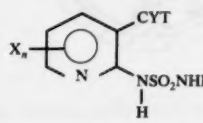
Lennon H. McKendry, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 676,591, Apr. 13, 1976, Pat. No. 4,014,888, which is a continuation-in-part of Ser. No. 572,024, Apr. 28, 1975, abandoned, which is a division of Ser. No. 412,944, Nov. 5, 1973, Pat. No. 3,920,641. This application Dec. 3, 1976, Ser. No. 747,267

Int. Cl.[2] C07D *295/10, 401/12, 213/55*

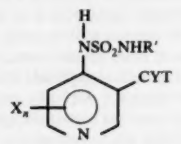
U.S. Cl. 544—111 **2 Claims**

1. A compound of the formulae:



III

and



IV

wherein:
each X independently represents loweralkyl, of 1 to 6 carbon atoms, haloloweralkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, SR^5, OR^5, aryl wherein aryl is phenyl, halophenyl or tolyl, $—NR^3R^4$, halo or nitro;
n represents an integer of 0 to 3, inclusive;
Y represents oxygen;
T represents a member selected from the group consisting of hydroxy or alkoxy of 1 to 3 carbon atoms;
R′ represents pyrrolidinoethyl, piperidinoethyl or morpholinoethyl;
each of R^3 and R^4 independently represent hydrogen or loweralkyl of 1 to 6 carbon atoms;
R^5 represents loweralkyl of 1 to 6 carbon atoms.

4,085,280

7-AMINOALKYL-3,7-DIARYL-3,3a,4,5,6,7-HEXAHYDRO-2H-INDAZOLES

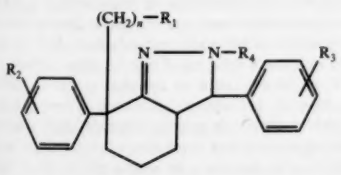
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 7, 1977, Ser. No. 785,396

Int. Cl.[2] C07D *231/56, 401/06, 413/06*

U.S. Cl. 544—140 **11 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein
R_1 is alkylamino, dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl or 4-alkyl-1-piperazinyl;
R_2 and R_3 are the same or different and are hydrogen, chloro, fluoro, alkyl, alkoxy or trifluoromethyl;
R_4 is hydrogen, alkyl, 2,2,2-trifluoroethyl, 2-hydroxyethyl, arylalkyl, or alkanoyl;
n is 1, 2 or 3; and
wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms, the term "aryl" refers to phenyl or phenyl substituted with a chloro, fluoro, alkyl, alkoxy or trifluoromethyl group, and the term "alkanoyl" refers to groups having 2 to 9 carbon atoms.

4,085,281

HEXAMETHYLENETETRAMINE PHENOXYLALKYL SALTS

James K. Pierce, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 23, 1976, Ser. No. 753,754

Int. Cl.[2] C07D *295/02*

U.S. Cl. 544—185 **5 Claims**

1. A compound selected from the group consisting of 3,5,7-triaza-1-azoniatricyclo(3.3.1.1^{3,7})-decane:1-(2-(2,4-dichlorophenoxy)ethyl)-, bromide; 3,5,7-triaza-1-azoniatricyclo(3.3.1.1^{3,7})decane:1-(2-(4-chloro-2-methylphenoxy)ethyl)-, bromide; 3,5,7-triaza-1-azoniatricyclo(3.3.1.1^{3,7})decane:1-(2-(2-chloro-4-fluorophenoxy)ethyl)-, bromide; and 3,5,7-triaza-1-azoniatricyclo(3.3.1.1^{3,7})decane:1(2-(2,4,5-trichlorophenoxy)ethyl)-, bromide.

4,085,282

PROCESS FOR PREPARING SUBSTITUTED TRIAZINES

John Arthur Jones, Belpre, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,669

Int. Cl.[2] C07D *251/70*

U.S. Cl. 544—197 **11 Claims**

1. A process for preparing tris-(polyhalophenylamino)triazines comprising reacting a polyhaloaniline with a cyanuric halide under superatmospheric pressure.

4,085,283

PHOSPHONATE-ISOCYANURATES

Marinus J. A. M. Den Otter, Munstergeleen; Albert A. Van Geenen, and Anne Te Nijenhuis, both of Brunssum, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

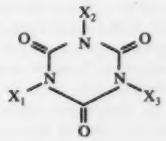
Filed Apr. 19, 1976, Ser. No. 678,438

Claims priority, application Netherlands, Apr. 19, 1975, 7504684

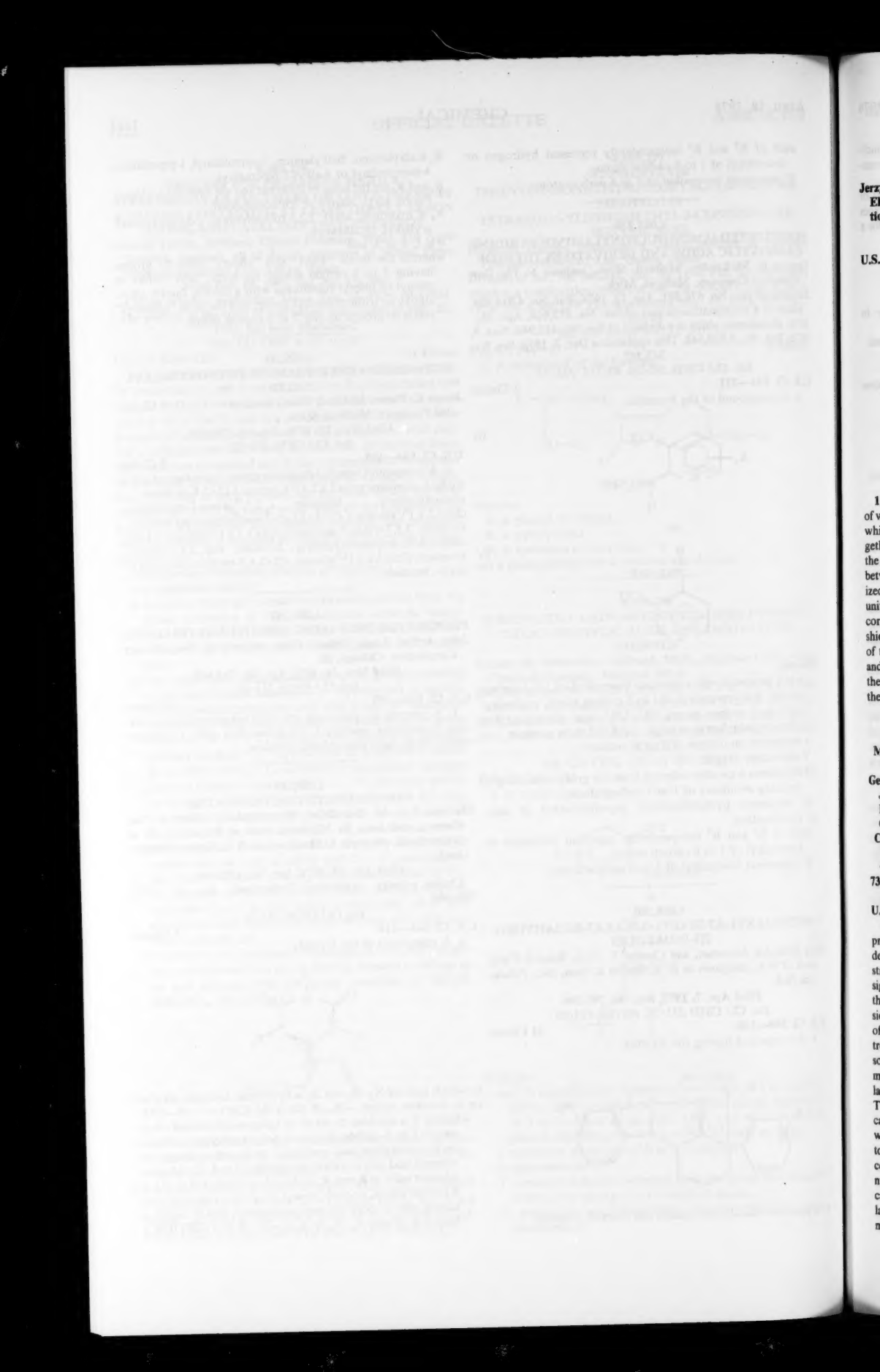
Int. Cl.[2] C07D *251/34*

U.S. Cl. 544—214 **7 Claims**

1. A compound of the formula



in which each of X_1, X_2 and X_3 is hydrogen, halogen, alkyl of up to 6 carbon atoms, —Y—P (O) (OR) (OR′) or —Y—OH wherein Y is alkylene or alkyl- or halogen-substituted alkylene of 1 to 6 carbon atoms; or polyoxyalkylene wherein each oxyalkylene unit contains 1 to 3 carbon atoms and wherein said polyoxyalkylene contains 2 to 4 of said units; wherein each of R and R′ is phenyl, or (cyclo)alkyl of 1 to 6 carbon atoms, or such phenyl, alkyl or cycloalkyl containing one or more halogen substituents; and in which at least one of said X_1, X_2 or X_3 is —Y—P (O) (OR) (OR′).

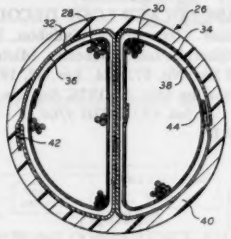


ELECTRICAL

4,085,284
D-SHIELD TELEPHONE CABLES

Jerzy A. Olszewski, Edison, and Ludwig Jachimowicz, Elizabeth, both of N.J., assignors to General Cable Corporation, Boonton, N.J.

Filed Aug. 10, 1976, Ser. No. 713,228
Int. Cl.[2] H01B *11/06*
U.S. Cl. 174—36 17 Claims



1. A communication cable which has two cable cores, each of which transmits messages in a different direction and each of which includes a plurality of insulated conductors bound together in a unit by a core wrap, metal shielding around each of the individual cores with a portion of the shielding extending between the cores to shield them from each other, characterized by the metal shielding including a shield around each core unit spaced from all of the conductors of the core unit by the core wrap being interposed between inside surface of the metal shield and the conductors of the corresponding core unit, each of the metal shields surrounding its own individual core unit and having an area that confronts and contacts with a part of the metal shield of the other core unit and that is bonded thereto.

4,085,285
METHOD OF MANUFACTURING PRINTED CIRCUIT BOARDS

Gerardus Johannes Meinardus Lippits; Petrus Johannes Janssen; Henricus Antonius Debruijn, and Johannes van Ruler, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

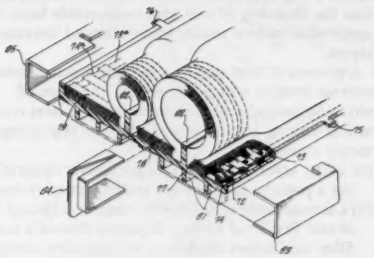
Continuation of Ser. No. 527,045, Nov. 25, 1974, abandoned. This application Aug. 6, 1976, Ser. No. 712,162
Claims priority, application Netherlands, Nov. 29, 1973, 7316313
Int. Cl.[2] H05K *3/18*
U.S. Cl. 174—68.5 6 Claims

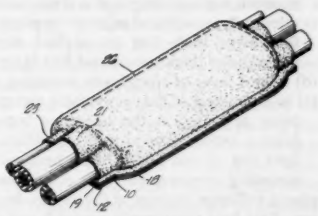
1. A method of forming completely metallized holes in printed circuit boards, said method comprising providing the desired holes in a substrate, contacting the walls of said substrate with an aqueous dispersion of TiO_2 particles, the charge sign of said TiO_2 particles in the dispersion being opposite to that at the walls of said holes while in contact with said dispersion, rinsing away any excess of said dispersion from the walls of said holes, subjecting the thus treated walls to a thermal treatment at a temperature of more than 50° C but less than the softening temperature or decomposition temperature of the material of said walls, the resultant walls being coated with a layer of TiO_2 particles one grain thick, treating the resultant TiO_2 coated walls of said holes with a solution of a metal salt capable of being reduced to metal nuclei by TiO_2 particles when exposed to actinic light, exposing the walls of said holes to actinic light thereby causing the walls of said holes to be coated with a metal nuclei layer and then subjecting said metal nuclei layer to the action of a solution of a metal compound capable of being chemically deposited on said metal nuclei layer in its metallic state to thereby increase the amount of metal on the walls of said holes.

4,085,286
HEAT-RECOVERABLE SEALING ARTICLE WITH SELF-CONTAINED HEATING MEANS AND METHOD OF SEALING A SPLICE THEREWITH

David August Horsma, Palo Alto, and Stephen Hunter Diaz, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 509,837, Sep. 27, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,344
Int. Cl.[2] H02G *15/18, 1/14;* B29C *27/24;* H05B *3/10*
U.S. Cl. 174—92 41 Claims





1. A heat recoverable article having self-contained heating means comprising a conductive polymeric composition, said polymeric composition being capable of conducting sufficient current there through at a given voltage and exhibiting sufficient resistance to give a heat output capable of causing the heat unstable material to recover to its original form, said conductive polymeric composition being so configured that its length and width are substantially greater than its thickness and said conductive polymeric composition being adapted for connection to a power source such that the current will flow through its thickness, said article being further characterized as comprising a polymeric material which has been dimensionally changed from an original heat stable form to a heat unstable form capable of moving in the direction of its original form upon the application of sufficient heat and being so configured that it can be positioned around a splice to be sealed.

6. A heat recoverable tubular article for sealing joints having self-contained and self-regulating heating means comprising a conductive polymeric heating composition exhibiting a positive temperature coefficient of resistance and having sufficient heating capacity when connected to an electrical power source, to cause at least a heat recoverable portion of the tubular article to recover around and seal a joint therebeneath.

9. A heat recoverable closure member having self-contained and self-regulating heating means and being adapted to heat recover around and seal a splice comprising a conductive polymeric heating composition, said composition exhibiting a positive temperature coefficient of resistance and having sufficient heating capacity when connected to an electrical power source to cause a heat recoverable portion of the closure member to heat recover, said closure member having first and second edges adapted to be brought together to form a tubular member and means for engaging said edges, said means maintaining said edges together during heat recovery.

20. A heat recoverable closure article having self-contained and self-regulating heating means and being adapted to be heat recovered around a joint comprising

(a) a first layer of conductive polymeric material exhibiting a positive temperature coefficient of resistance,

(b) at least one additional layer of conductive polymeric material adjacent a surface of said first layer exhibiting substantially constant resistance upon change in temperature to give a substantially constant wattage output at a given voltage,

(c) electrodes positioned adjacent opposite surfaces of said first layer such that an applied current will flow through the thickness of said first layer; and at least one of said layers being heat recoverable, said layers being adapted so that the recovery of said heat recoverable layer upon the application of heat results in recovery of the other of said layers.

29. A process of heat sealing a joint between members without external heating means comprising the steps of:

positioning around said joint to be sealed a heat-recoverable article having self-contained and self-regulating heating means comprising

(a) a first layer of conductive polymeric material exhibiting a positive temperature coefficient of resistance,

(b) a second layer of polymeric material adjacent a surface of said first layer having dispersed therein a conductive filler, said layers exhibiting substantially constant resistance upon change in temperature to give a substantially constant wattage output at a given voltage,

(c) electrodes positioned adjacent opposite surfaces of said first layer such that an applied current will flow through the thickness of said first layer,

(d) a third layer of electrically insulating material,

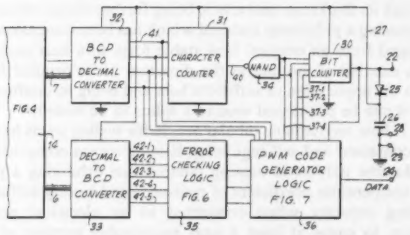
(e) an inner layer of heat activatable material, said material being activated at the operating temperature of the heating article to bond to the members to be sealed, at least one of said layers being heat recoverable at the operating temperature of the article; and

applying sufficient current to the electrodes to cause recovery of the heat recoverable materials and activation of the adhesive.

4,085,287
DATA TRANSMITTING APPARATUS

Donald J. Kullmann, Tallassee; Daniel A. Seltzer, Montgomery, and Raymond L. Kirby, Tallassee, all of Ala., assignors to Neptune Water Meter Company, Tallassee, Ala.

Filed Dec. 19, 1975, Ser. No. 642,574
Int. Cl.² H04L *17/00*
U.S. Cl. 178—66 R **30 Claims**



1. Apparatus for transmitting data, comprising:

(a) a source of cyclically repeated clock pulses;

(b) means connected to said source for transmitting data serially in characters, each character comprising a plurality of signal bits, each signal bit comprising an initial fraction and a data-carrying fraction, the duration of each of said fractions being an integral number of clock pulse cycles, said transmitting means including:

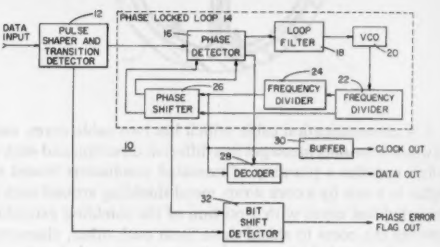
(1) coding means for shifting the potentials of the data-carrying fractions of successive bits to a first potential to indicate a binary "0" and to a second potential to indicate a binary "1", in accordance with data to be transmitted; and

(2) initial bit marking means for shifting the potential of the initial fraction of the first bit in each character from one of said first and second potentials to the other for a period shorter than said initial fraction.

4,085,288
PHASE LOCKED LOOP DECODER

Lakshminarasimhan Viswanathan, Audubon, Pa., assignor to Computer Peripherals, Inc., Rochester, Mich.

Continuation of Ser. No. 572,424, Apr. 28, 1975, abandoned.
This application Oct. 22, 1976, Ser. No. 734,844
Int. Cl.² H03B *3/04*
U.S. Cl. 178—69.1 **16 Claims**



1. Phase locked loop decoder for decoding data signals having a given frequency and representative of digitally encoded data bits, each bit being encoded within a bit cell, comprising:

clock means for generating a data clocking signal for each bit cell;

phase error detection means for generating a digital pulsed phase error signal having a leading edge synchronized with the occurrence of each transition of said data signal within each bit cell and having a pulse width representative of the difference in time of occurrence of said data signal with respect to said cell clocking signal, and having an output;

clock synchronizing means responsive to said phase error signal for maintaining substantially continuous synchronization between said data signals and said clocking signal by advancing or retarding subsequent clocking signals; and

data decoder means synchronized by said clocking signal for decoding said output of said phase error detection means at said given frequency.

4,085,289
LOUDSPEAKER SYSTEM

Jeffrey B. Schmideler, 2978 No. 54th St., Milwaukee, Wis. 53210

Filed Oct. 18, 1976, Ser. No. 733,330
Int. Cl.² H04R *1/28, 1/34*
U.S. Cl. 179—1 VE **4 Claims**

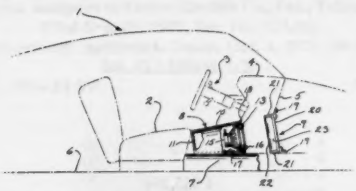
1. In the passenger compartment of a vehicle having a floor, a front seat, a firewall, and a dashboard extending rearwardly from the firewall and forming a dash cavity and having an exposed lower corner, the combination comprising:

(a) an elongated flexible plastic generally bucket-shaped speaker enclosure having front and rear end portions,

(b) said enclosure being disposed in tight confinement between said seat and the said exposed lower corner of said dashboard and with the said front end portion of said enclosure sealingly engaging said lower corner,

(c) and a speaker disposed in said enclosure and co-axial

therewith and with said speaker facing forwardly to radiate sound from said contained enclosure past the said



portion of sealing engagement and beneath said dashboard.

4,085,290
TELEPHONE CONFERENCE AMPLIFIER

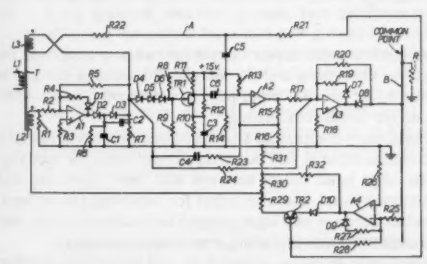
Ralph Archibald Jones, London, England, and Allan Mathieson Drew, Glasgow, Scotland, assignors to Post Office, London, England

Filed Nov. 8, 1976, Ser. No. 739,975

Claims priority, application United Kingdom, Nov. 17, 1975, 47251/75

Int. Cl.² H04M *3/56*; H01L *23/56*

U.S. Cl. 179—1. CN **13 Claims**



1. A telephone conference amplifier circuit having a plurality of channels each for a respective participant, each channel including means for producing an envelope signal from an input signal, means for combining the envelope signal with the input signal to produce a unidirectional polarity signal, first individual unilaterally conducting means connected for applying the unidirectional polarity signal to a point common to all of the channels, second individual unilaterally conducting means connected to derive the unidirectional polarity signal from the common point, means for producing a symmetrically polarised output signal from the unidirectional polarity signal derived by the second unilaterally conducting means and means responsive to the unidirectional polarity signal derived by the second unilaterally conducting means and inhibited by a signal related to the unidirectional polarity signal in the signal path to the common point to apply a voltage to the means for producing an envelope signal to reduce its sensitivity, whereby the circuit imposes a higher threshold, dependent on said voltage, to be overcome by a participant wishing to talk in a channel other than an active channel previously carrying signals from a participant talking, wherein the combining means includes an automatic level control means for limiting the range of variation of amplitude of a speech waveform derived from the input signal before it is combined with the envelope signal to produce the unidirectional polarity signal which is applied to the common point, the automatic level control means not being effective on the envelope signal.

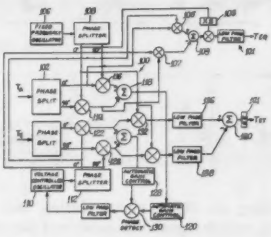
4,085,291
SYNTHETIC SUPPLEMENTARY CHANNEL MATRIX DECODING SYSTEMS

Duane H. Cooper, 918 W. Daniel St., Champaign, Ill. 61820

Continuation-in-part of Ser. No. 468,238, May 9, 1974, Pat. No. 3,985,978, Ser. No. 578,078, May 16, 1975, Pat. No. 3,970,788, which is a continuation-in-part of Ser. No. 288,873, Sep. 13, 1972, Pat. No. 3,906,156, and Ser. No. 187,065, Oct. 6, 1971, Pat. No. 3,856,992. This application Jun. 30, 1976, Ser. No. 701,228

Int. Cl.² H04R *5/00*

U.S. Cl. 179—1 GQ **14 Claims**



1. In a method for decoding at least two original matrixed transmission channels having multidirectional source signals encoded therein with predetermined amplitude and phase relations indicative of source directions and adapted to be decoded for formation of more than two loudspeaker presentation signals, the improvement comprising

generating at least one synthetic supplementary channel from said original transmission channels having predetermined amplitude and phase relations differently indicative of source directions relative to the amplitude and phase relations of the multidirectional source signals encoded in said original transmission channels, by steps comprising detecting source signal image direction from the signals of said original transmission channels and providing said source signals matrixed in each such synthetic supplementary channel with amplitude and phase relations for such detected source signal image direction differently indicative of source directions from the amplitude and phase relations of said original matrixed channels, and

decoding said original transmission channels and said synthetic supplementary channels to provide multidirectional presentation signals having enhanced image location.

4,085,292
COMBINATION ALARM AND AUTOMATIC TELEPHONE ANSWERING SYSTEM

David Louis Leslar, and John Cyril Kirk, both of Mississauga, Canada, assignors to Alarmco Inc., Scarborough, Canada

Filed Nov. 1, 1976, Ser. No. 737,449

Int. Cl.² H04M *11/04*

U.S. Cl. 179—2 A **4 Claims**

1. A combination alarm and automatic telephone answering apparatus adapted for monitoring at least one potential alarm condition at a remote location and adapted for connection to a telephone line, comprising:

(a) at least one alarm sensor connected to said apparatus for sensing the existence of a predetermined alarm condition;

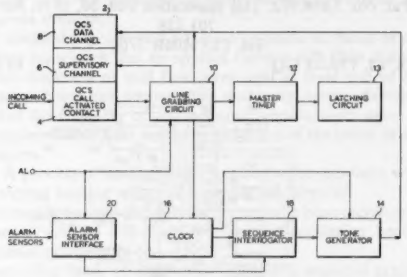
(b) controllable means responsive to an incoming call on said telephone line for engaging said line;

(c) control means coupled to said line engaging means for selectively interconnecting said line engaging means with said line so that when said control means is in a first condition said line is engaged in response to an incoming call on said telephone line, and when said control means is in a second condition said line is engaged in response to an incoming call on said telephone line only when said alarm sensor is in an alarm condition;

(d) means coupled to said line engaging means and adapted to maintain said line engaging means in engagement with said line for a predetermined interval when said control means is in said first condition;

(e) means connected to said alarm sensor for checking the condition thereof; and

(f) means connected to said alarm sensor checking means for



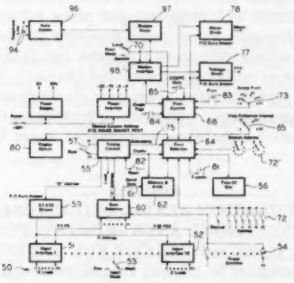
generating an alarm signal during said predetermined interval, which signal is indicative of the condition of such alarm sensor, said generating means being connected to said telephone line during said predetermined interval whereby said alarm signal is fed along said telephone line to the place where said call was initiated, to thereby provide an indication at said place of the existence of said alarm condition.

4,085,293

TRAFFIC USAGE RECORDER

Ernest C. Karras, Oak Brook, Ill., assignor to Tekno Industries, Inc., Bensenville, Ill.

Filed Jun. 28, 1976, Ser. No. 700,021
Int. Cl.[2] H04M *3/36*
U.S. Cl. 179—8 A **18 Claims**



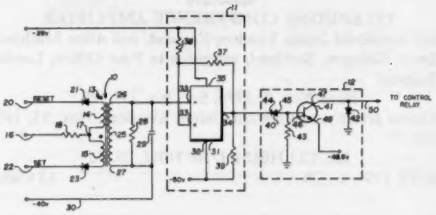
1. A traffic usage recorder for observing traffic through a plurality of telecommunication circuits, each having at least one individually-associated wire, said recorder comprising a plurality of input terminal means, each of said terminal means providing an access point which may be connected to the wires asociated with said circuits to thereby connect said circuits to said recorder, said circuits marking the wires individually associated therewith by a distinctive potential according to the usage of the circuit, means for repeatedly scanning each of said input terminal means to detect a presence or absence of said distinctive potential upon said wires and therefore the usage of the associated circuit prevailing at the time of the scan, means for combining said data on individually-associated wires into grouped data concerning groups of mutually-related wires, and means responsive to data derived from each of said terminals for indicating C.C.S. units, peg count, and responsive to said grouped data for indicating maximum simultaneous switch usage, and a cumulative time during which said maximum usage occurs.

4,085,294

CONTROL POINT DRIVER CIRCUIT

Robert M. Thomas, Maitland, and John A. Gauthier, Brockville, both of Canada, assignors to GTE Automatic Electric (Canada) Ltd., Brockville, Canada

Filed Aug. 2, 1976, Ser. No. 711,019
Int. Cl.[2] H04M *3/00*
U.S. Cl. 179—16 AA **6 Claims**



1. A control point driver circuit for use in a telephone exchange for energizing and de-energizing a control element in response to set or reset input pulses respectively, said control point driver circuit comprising:

a transformer comprising a centertapped primary winding, a common input at said centertap, a reset input for receiving the reset input pulses between said reset input and said common input, and a set input for receiving the set input pulses between said set input and said common input, said transformer also including a secondary winding;

control voltage means coupled to said secondary winding for providing at said secondary winding a fixed control voltage in the absence of a set or reset input pulse and for providing at said secondary winding in combination with induced transformer voltages a first augmented control voltage in the presence of a reset input pulse and a second augmented control voltage in the presence of a set input pulse; and

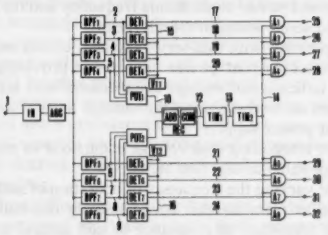
bistable means including a voltage comparator having first and second input terminals and an output terminal for comparing the voltage level at said first input terminal and the voltage level at said second input terminal, said voltage comparator assuming a set state thereby generating a set output signal at said output terminal when said voltage levels at said first and second input terminal have a first predetermined relationship and assuming a reset state thereby generating a reset output signal at said output terminal when said voltage levels at said first and second input terminals have a second predetermined relationship, said first input terminal coupled to said secondary winding, said bistable means further including first circuit means connected between said second input terminal and said output terminal for supplying a first reference voltage at said second terminal when said set output signal is present and for supplying a second reference voltage at said second terminal when said reset output signal is present,

second circuit means connecting said output terminal to said control element.

4,085,295
MULTI-FREQUENCY SIGNAL RECEIVERS

Tadahiro Goto, Tachikawa, and Munemasa Soma, Tokyo, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1976, Ser. No. 727,346
Claims priority, application Japan, Oct. 1, 1975, 50-117635
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF 3 Claims

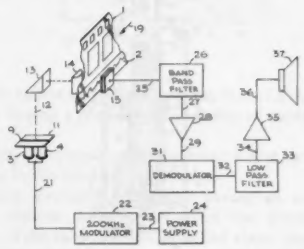


1. A multi-frequency signal receiver comprising an automatic gain control circuit for adjusting the level of said multi-frequency signal such that the level difference between high and low frequency signal components of said multi-frequency signal on the input side of the automatic gain control circuit is made equal to that on the output side when the level of said multi-frequency signal is constant, a plurality of bandpass filters for separating the output from said automatic gain control circuit into respective frequency signals, said bandpass filters being grouped into two groups, two detectors respectively detecting the output from said two groups of said bandpass filters for producing output voltages respectively proportional to the output from said two groups, a recognition circuit for producing an output when the level of the sum of outputs from said two detectors exceeds a predetermined level, and a plurality of gate circuits respectively responsive to the output from said recognition circuit for passing the outputs from said plurality of bandpass filters.

4,085,296
MODULATED SOUND READING SYSTEM

Pat Keegan, Van Nuys, Calif., assignor to International Audio Visual, Inc., Van Nuys, Calif.

Filed Dec. 19, 1975, Ser. No. 642,308
Int. Cl.[2] G11B *7/00*
U.S. Cl. 179—100.3 R 9 Claims

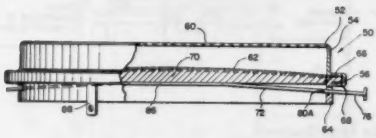


1. A sound reading system for transducing the optical sound track from sound-on-film motion picture film, comprising:
monochromatic light emitting diode means for excitation of said sound track;
means for modulating the light output from said light emitting diode means at a fixed carrier frequency that is higher than the highest audio frequency to be read from said sound track;
photodetector means responsive to the monochromatic light from said excited sound track for producing an electrical carrier output signal which is amplitude modulated in conformance with the optical transmission characteristic of said sound track; and
means for demodulating the amplitude-modulated carrier signal output from said photoselector means to provide an audio output signal.

4,085,297
SPRING FORCE BIASING MEANS FOR ELECTROACOUSTICAL TRANSDUCER COMPONENTS

Richard Paglia, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 13, 1977, Ser. No. 806,056
Int. Cl.[2] H04R *19/00*
U.S. Cl. 179—111 R 22 Claims

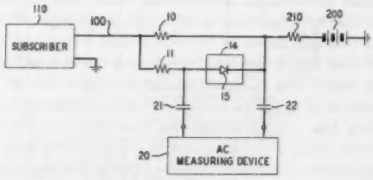


1. An improved electroacoustical transducer assembly of the type including,
a housing,
said housing defining a sidewall portion,
a vibratile, electrically conductive layer,
means for maintaining a portion of an annular region of said layer in a fixed position with respect to said housing,
an electrically nonconductive layer adjacent said electrically conductive layer,
a substantially inflexible plate-like member having an electrically conductive surface,
wherein the improvement comprises:
an elongated resilient member having at least two end portions,
said end portions of said elongated resilient member cooperatively engaging said housing sidewall portion such that an intermediate portion of said elongated resilient member presses on said plate-like member causing said plate-like member to press on said electrically nonconductive layer thereby forcing said nonconductive layer into tensioning engagement with said electrically conductive layer.

4,085,298
MEASUREMENT OF CURRENT THROUGH A LINE SUBJECT TO SPURIOUS HIGH POTENTIALS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 28, 1976, Ser. No. 700,312
Int. Cl.[2] H04B *3/46;* H04M *3/00*
U.S. Cl. 179—175.3 R 8 Claims



1. A direct current measuring circuit comprising:
a signal sensitive element;
means for coupling a portion of said direct current to said signal sensitive element; and

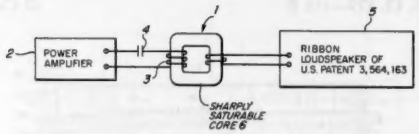
means, coupled through solely capacitive means to said signal sensitive element for measuring a preselected parameter of said signal sensitive element.

4,085,299

PEAK AMPLITUDE PROTECTION SYSTEM FOR RIBBON LOUDSPEAKERS

Gilbert L. Hobrough, P.O. Box 35369, Vancouver, British Columbia, Canada

Filed Jun. 24, 1977, Ser. No. 809,534
Int. Cl.[2] H04R *3/00*
U.S. Cl. 179—184 **10 Claims**



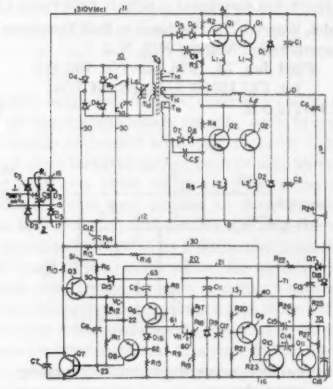
1. In combination:
a. a ribbon loudspeaker having an input circuit;
b. a power amplifier having an output circuit;
c. a transformer having an input circuit coupled to the output circuit of said power amplifier and an output circuit coupled to the input circuit of said ribbon loudspeaker and a magnetic core which saturates at a value of the time integral of the voltage applied to said input circuit of said transformer low enough to prevent extraordinary large amplitude fluctuations of the ribbon of said ribbon loudspeaker; and
d. a current limiting device for preventing said loudspeaker from drawing substantial power from said power amplifier due to saturation of said magnetic core.

4,085,300

FREQUENCY CONTROLLED INDUCTION COOKING APPARATUS

Raymond W. MacKenzie, Pittsburgh; Peter Wood, Murrysville; Theodore M. Heinrich, Murrysville, and Robert M. Oates, Murrysville, all of Pa., assignors to White-Westinghouse Corporation, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 532,550, Dec. 13, 1974, abandoned. This application May 3, 1976, Ser. No. 682,489
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R **4 Claims**



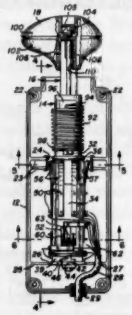
1. In an apparatus for heating a cooking utensil by magnetic induction and operative with a direct current power supply, the combination of:
induction coil means adapted to be inductively coupled to a cooking utensil;
series resonant circuit means having a natural frequency of resonance in the ultrasonic range and including said induction coil means;
switching means connected to said direct current power supply for converting direct current power into alternating current power at ultrasonic frequency and for energizing said series resonant circuit means;
means operative with said series resonant circuit means and said direct current power supply for providing a first signal indicative of voltage excursions of said series resonant circuit means beyond the voltage level of said direct current power supply;
means for integrating said voltage excursions to provide an average value of said first signal;
means for varying the frequency of operation of said switching means from at least approximately one-half of said natural frequency of resonance to said natural frequency of resonance in response to said first signal to control the power output of said apparatus when said induction coil means is inductively coupled to a cooking utensil; and
control means for providing a manual control signal, said frequency varying means being responsive to both said first signal and said manual control signal, said frequency varying means including means for clamping said switching means, time delay means for establishing a clamp time interval, with said time delay means being responsive to both said first signal and said manual control signal for establishing a time constant in relation to said first and manual control signals, said frequency varying means further including means responsive to said time delay means and operative with said clamping means for changing the frequency of operation of said switching means in relation to said clamp time interval.

4,085,301

HAND-HELD CONTROLLER DEVICE

Ronald A. Smith, Los Gatos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sep. 16, 1976, Ser. No. 724,044
Int. Cl.[2] H01H *25/00*
U.S. Cl. 200—4 **7 Claims**



1. A controller device comprising:
an outer housing having an opening therein;
an elongated generally cylindrical member having a bore extending longitudinally therein from one end thereof and having pivot means pivotally securing the other end thereof to said housing, said member being disposed within said housing with said one end disposed proximate said opening;
first resilient means for normally biasing said cylindrical

member into a rest position but permitting said one end to be moved laterally relative to the longitudinal axis of said cylindrical member;

first switching means disposed around said cylindrical member so as to be actuated by said lateral movement of said one end and including at least four lateral contact members carried by said cylindrical member, and fixed contact means carried by said housing, whereby said lateral movement of said one end of said cylindrical member in any direction causes at least one of said lateral contact members to engage said fixed contact means;

plunger means including an elongated rod having a first end disposed within said bore and a second end extending out of said housing through said opening;

second resilient means for normally biasing said plunger means into a predetermined position relative to said cylindrical member but permitting said plunger means to be both rotated about its longitudinal axis and translated therealong;

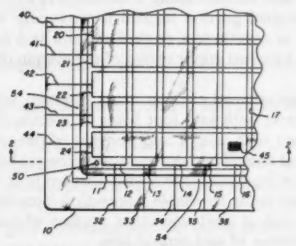
second switching means affixed to said cylindrical member and actuated by translational axial movement of said plunger means; and

third switching means affixed to said cylindrical member and actuated by rotational motion of said plunger means, whereby lateral, translational or rotational forces applied to said second end of said plunger means cause said first, second and third switching means to develop corresponding signals.

4,085,302
MEMBRANE-TYPE TOUCH PANEL

George Edward Zenk, Richfield; Robert Joseph Johnson, Inver Grove Heights, and Charles Newell Miller, Richfield, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 22, 1976, Ser. No. 743,992
Int. Cl.[2] H01H *13/52*
U.S. Cl. 200—5 A **11 Claims**



1. A switch matrix to be carried on the face of a rigid insulator substrate having a predetermined radius of curvature, and comprising:

a. a plurality of spaced apart conductive first strips firmly adhering to the face of the substrate;

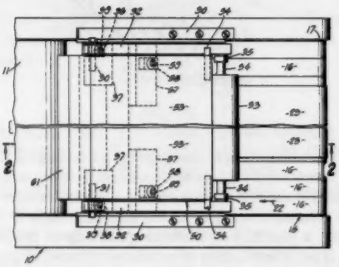
b. a resilient insulating membrane having an undistorted curved contour substantially alike the predetermined contour of the substrate, and attached about its periphery to the face of the substrate in a position matching the membrane contour to the substrate contour and supported apart from the first strips thereon in a predetermined area of the membrane by the natural resilience of the curved contour; and

c. a plurality of flexible, spaced apart conductive second strips firmly adhering to the resilient membrane surface facing the substrate, each of said second strips located in the area spaced apart from the first strips and thinner than the spacing therefrom, and each of said second strips crossing at least two first strips.

4,085,303
SAFETY DOUBLE PROTECTION DEVICE FOR MACHINES HAVING PLURAL CIRCUIT BREAKER ASSEMBLIES ASSOCIATED WITH DOFFER ROLLER AND HAND GUARD

Robert Alfred McIntyre, Bell, Calif., and Kenneth Harlan Wolverton, Arlington, Tex., assignors to Ametek, Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,690
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—61.41 **3 Claims**



1. A double protection device for use on a machine into which material is hand fed to shut off the machine when any part of an operator's hand passes into the entrance of that machine, the device comprising:

a frame having a material moving belt mounted thereon;

a doffer roll pivotally mounted on said frame to engage material being hand fed into the machine and press that material against said belt, said doffer roll and said belt defining the entrance to the machine;

a first machine shutdown mechanism for shutting off the machine, said first shutdown mechanism including a first safety switch mounted on said frame and operatively connected to said doffer roll to be actuated by pivotal movement of said doffer roll away from said belt beyond a predetermined distance, said predetermined distance corresponding to the movement undergone by said doffer roll away from said belt if an operator's fingers are caught between said doffer roll and said belt, said doffer roll thereby exerting pressure against the material being fed into the machine and actuating said first safety switch;

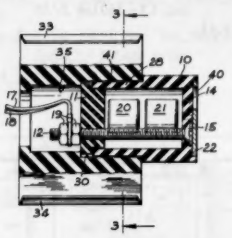
a second machine shutdown mechanism for shutting off the machine, said second shutdown mechanism mounted on said frame and including a safety guard cover pivotally mounted on said frame and located immediately behind said doffer roll in the direction of movement of said belt and to be thereby located closely adjacent said entrance and having a lower portion located just above said belt and a second safety switch mounted on said frame and operatively connected to said guard cover to be actuated by pivotal movement of said guard cover, said guard cover pivotal movement being caused by contact thereof with an operator's fingers, said second safety mechanism being in series with said first safety mechanism to back up said first safety mechanism and shut off the machine in the event said first safety mechanism fails to do so thereby providing a double protection system which is located at the entrance to the machine.

4,085,304

VIBRATION SWITCH HAVING THREADED TERMINALS AND PLURAL ROLLER CONTACTS

William Sandford Hasler, Blackburn, England, assignor to Shorrock Developments Limited, Blackburn, England

Filed Aug. 13, 1976, Ser. No. 714,107
Int. Cl.[2] H01H *35/00*
U.S. Cl. 200—61.45 R **4 Claims**



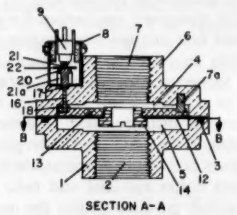
1. A vibration switch comprising, a housing, a side-by-side pair of substantially parallel, horizontally-disposed, elongate, electrically-conductive terminals supported within the housing, the terminals being of a configuration such as to present, upwardly, a plurality of discrete spaced-apart points and supporting from below a pair of loose, cylindrical, aligned, electrically-conductive bodies which partly occupy a space within the housing above the terminals, the terminals being spaced-apart by a distance such that the bodies cannot drop through and being respectively spaced away from the nearest adjacent part of the housing by a distance such that the bodies, if shaken out of contact with the terminals, cannot fall below the terminals but will fall back to be supported by the terminals.

4,085,305

LIQUID FLOW SWITCH

Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530

Filed Dec. 6, 1976, Ser. No. 748,126
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 A **5 Claims**



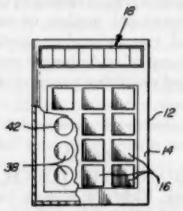
1. A liquid flow switch comprising two housings, defining a fluid tight space there between, a flexible pressure responsive diaphragm comprising a flexible material, a diaphragm plate, wherein said diaphragm and said diaphragm plate are secured together by means of a threaded plug, said threaded plug having an opening providing communication between two compartments, whereby the size of said opening functions to determine a differential pressure for a specific flow rate obtained through said opening, said flexible pressure responsive diaphragm separates the space into two said compartments, a rigid member of one said compartment having an edge surface in said space opposed to an edge surface of second compartment and in close proximity therewith, the edge surfaces jointly defining a clamp to hold said pressure responsive diaphragm, a pin extending from said housing provides means for pivoting said pressure diaphragm plate about said pin, an electrical contact mounted on said housing exteriorly of said space, an actuator for actuating said contact to an operative position comprising a flexible flat spring mounted exteriorly of said housing for flexing to a position to close said contact, an axially displacable pin in communication with the interior of said housing, and extending outwardly thereof for bearing against said flexible flat spring to deflect in a direction for closing said contact, an activating element mounted on said diaphragm for movement therewith to contact and engage said pin to actuate it in response to a pressure differential in said compartments flexing the diaphragm in a direction for actuating said liquid flow switch, and connectors for applying the fluid to two said compartments to develop said differential pressure whereby said differential pressure is a function of size of opening in said threaded plug for a specific flow rate.

4,085,306

KEYBOARD SWITCH ASSEMBLIES

Bill D. Dunlap, Longmont, Colo., assignor to KB-Denver, Inc., Frederick, Colo.

Filed Jun. 9, 1977, Ser. No. 804,945
Int. Cl.[2] H01H *1/06, 13/52*
U.S. Cl. 200—275 **7 Claims**



1. In a keyboard assembly which includes an insulative substrate upon which is carried a plurality of conductive paths, respective portions of which are selectively bridged upon depression of a conductive resilient contact element, the improvement comprising:

said contact element being in the shape of a dome and having a marginal portion formed downwardly away from its apex to constitute a single foot with said foot occupying only a limited minor extent of the margin of said element, and

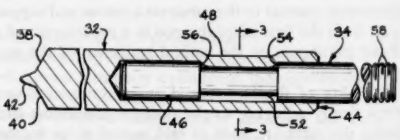
said dome-shaped element being disposed adjacent to said substrate with said foot being in electrical and physical contact with one of said portions of one of said paths, a central area of said dome-shaped element being in registry over at least one other of said portions in at least one other of said paths to enable connection between said central area and at least one other portion of said paths upon depression of said central area.

4,085,307

WELDABLE INSULATION FASTENER AND APPARATUS FOR WELDING

John C. Jenkins, Lorain, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 2, 1976, Ser. No. 663,056
Int. Cl.[2] B23K *9/20*
U.S. Cl. 219—98 **9 Claims**



1. In combination, a cryogenic container having an aluminum wall, an elongate fastener for holding a layer of insulating

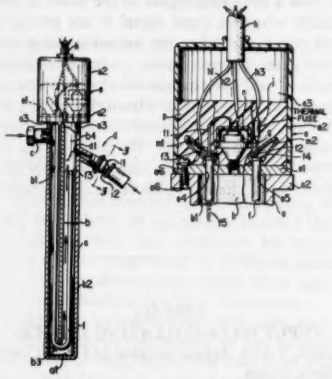
material adjacent an outer surface of said aluminum wall, said fastener comprising an end-weldable stud of aluminum having a weldable tip at one end thereof and having means at the opposite end for affixing an elongate member thereto, an elongate member of low-conducting material having one end affixed to said affixing means of said stud and extending co-axially away from said stud, said elongate member being made of a multiplicity of longitudinally-extending, parallel glass fibers encased in a resinous material, the end of said elongate member opposite said stud having means to receive a clip to aid in holding the layer of insulating material adjacent the surface of said aluminum wall, and a clip on said elongate member and held by said clip-receiving means for contacting an outer surface of the layer of insulating material to hold it against the surface of the aluminum wall.

4,085,308

ELECTRIC WATER HEATER FOR SHOWERS

Rex Veech Youngquist, 7800 SW. 67th St., Miami, Fla. 33143

Filed Nov. 26, 1976, Ser. No. 745,199
Int. Cl.[2] H05B *1/02, 3/82;* **F24H** *1/10*
U.S. Cl. 219—309 **10 Claims**



1. An improved automatic electric in-line water heater of the type having

(a) a hollow vertical casing closed at its bottom and open at its top,

(b) a vertical partition dividing said casing into first and second longitudinally extending compartments communicating with each other at their lower ends, and essentially separated by said partition at their upper ends,

(c) a water inlet delivering into the upper portion of one of said first and second compartment,

(d) a relatively restricted water outlet delivering from the upper part of the other of said first and second compartments,

(e) said heater having a top closure assembly for said casing comprising a base portion covering said open casing top and a removable cover portion defining with said base portion a receptacle,

(f) an electrical heating means having a rigid tubular housing with an electrical heating element therein and terminal portions at its ends, said heating means being mounted in said base portion with its ends in said receptacle,

(g) pressure-actuated switch means in said receptacle having a pressure chamber therein communicating with said casing through said base portion, and

(h) three conductor current supply means secured to said assembly with one of its conductors grounded and two of its conductors connected to said heating element and switch means in series connection,

and including the improvement that

(i) said rigid tubular housing is mounted in said base portion through first and second apertures therein both overlying said first compartment at one side of said partition,

(j) said rigid tubular housing extends downwardly in said first compartment from its mounting in said first aperture to a position proximate to the closed bottom of said vertical casing, thence into and upwardly in said second compartment to a bend at a height therein lower than the height of said liquid outlet from said casing, thence from said bend downwardly in said second compartment to a position proximate to the closed bottom of said vertical casing, and thence into and upwardly in said first compartment to its mounting in said second aperture, and

(k) said electrical heating element is confined to those portions of said rigid tubular housing located below the level of said water inlet,

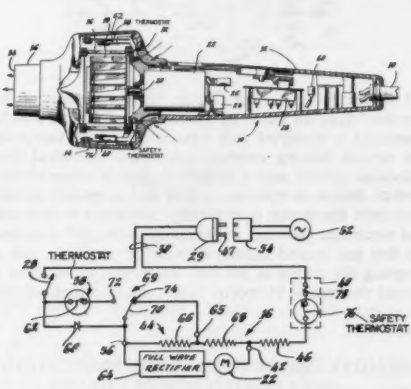
whereby in use said water is effectively heated without excessive heating of said base portion or of any portion of said heating means.

4,085,309

CONTROL CIRCUIT ARRANGEMENT FOR A PORTABLE ELECTRICALLY HEATED HAIR TREATMENT APPLIANCE

Siegfried Godel, Norwalk; Albert Adam Pudims, Stratford, and Richard Wergzyn, Bridgeport, all of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.

Filed Jun. 4, 1975, Ser. No. 583,617
Int. Cl.[2] H05B *1/02;* **A45D** *20/08;* **F24H** *3/04*
U.S. Cl. 219—364 **5 Claims**



1. An improved heater control for an electrical appliance comprising,

a. an appliance casing having an air inlet and an air outlet,

b. means positioned in said casing for establishing an airstream from said inlet through said casing to said outlet,

c. an electrical resistance heater positioned within the casing in said airstream,

d. means including a switch means for applying an alternating potential to energize said heater to heat the airstream to an operating temperature T_1,

e. means within the airstream for sensing the heat of the airstream and electrically connected in series circuit with said switch means, said sensing means being operable to automatically open said series circuit to interrupt said alternating potential energization of the heater when said operating temperature exceeds a safe limit temperature T_2 which is greater than temperature T_1, and

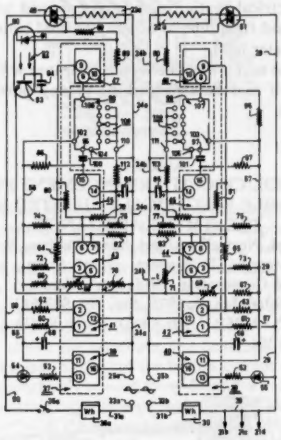
f. half-wave rectifier means electrically connected across said sensing means for applying half-cycles of the applied alternating potential to the heater during said open circuit condition of the series circuit.

4,085,310

CONTROL DEVICE FOR ELECTRIC HEATING SYSTEMS OF THE BI-JUNCTION TYPE FOR AN APARTMENT BUILDING

Jean-Pierre René Coulmance, Osny, and Jean-Claude Gérard Six, Sevres, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,364
Claims priority, application France, Mar. 26, 1975, 75 09447
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—502 **5 Claims**



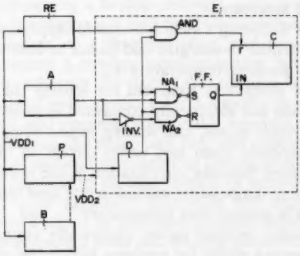
1. A control device for electric heating systems of the "bi-junction" type for use in an apartment building in which each apartment is equipped with convectors which comprise first and second heating resistors which are energized from an individual circuit and a collective circuit respectively, said control device comprising a first and a second modulating electronic thermostat respectively connected to first and second electronic switches individually connected in series with the first and second heating resistors respectively, and means coupling the output of the first thermostat to an input of the second thermostat by means of an opto-electronic device.

4,085,311

MEMORY DEVICE WITH ERROR PREVENTION OF DATA DURING POWER FAILURE

Kyoichi Ohsako, Tokyo, and Katusuke Yamashita, Matsudo, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Feb. 20, 1976, Ser. No. 659,710
Claims priority, application Japan, Feb. 27, 1975, 50-24300
Int. Cl.[2] G06M *3/12*; G07D *9/00*
U.S. Cl. 235—92 FP **4 Claims**



1. Memory device comprising input circuit means adapted to provide input signal pulses, at least one IC counter having an input section and a reset section, bi-stable set and reset type switching means having an output section connected with the input section of the IC counter, said bi-stable switching means having a set and a reset terminal, power source voltage sensing means for providing a low output signal when power source voltage is below a predetermined value, and a high output signal when power source voltage is above a predetermined level, first gate means having one input connected with the sensing means and another input connected with said input circuit means and having an output connected with one of the set and reset terminals of the switching means, second gate means having one input connected with the sensing means and another input connected with said input circuit means through inverting means, said second gate means having an output connected with the other of the set and reset terminals of the switching means, one of said first and said second gate means being adapted to pass a switching signal to the associated one of the set and reset terminals of the switching means when an input signal is received from the input circuit and when the output signal is not applied thereto from the power source voltage sensing means, the other of said gate means being adapted to pass a switching signal to the other of the set and reset terminals when an input signal is not produced in the input circuit means and when the output signal is not applied thereto from the power source voltage sensing means, whereby both of said gate means are closed when the output signal is applied to the gate means from the sensing means due to a decrease in the power source voltage, auxiliary power supply means connected to the IC counter, the switching means and the gate means for maintaining a supply of electrical power thereto when there is a decrease in the power source voltage.

4,085,312

INPUT DATA-COLLATING DEVICE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1976, Ser. No. 692,438
Claims priority, application Japan, Jun. 4, 1975, 50-66406
Int. Cl.[2] G06F *11/08*
U.S. Cl. 235—306 **4 Claims**

1. A data-collating device for a bill data input apparatus having input key means for delivering a plurality of bill data and electronic memory means for receiving and serially storing the bill data from the input key means, said data-collating device comprising:

designation means for designating at least one specified part of each bill data stored in said memory means so as to deliver the same again from said input key means;

collation means coupled to said memory means for collating the specified part of each bill data delivered again from said input key means with the corresponding part of the bill data stored in said memory means;

input means coupled to said collation means and to said memory means for preventing the specified part of the bill data delivered again from said input key means from being stored into said memory means when said collation means detects coincidence and for permitting the specified part of the bill data delivered again from said input key means to be stored into said memory means in place of the corresponding part of the bill data stored in said memory means when said collation means detects noncoincidence;

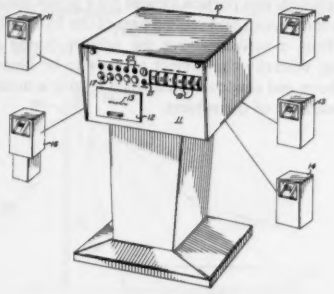
detection means for detecting the completion of the collation of all the bill data; and

means coupled to said detection means for writing into said memory means a signal indicating the completion of collation in response to a signal from said detection means.

4,085,313
AUTOMATIC PRODUCT-DISPENSING SYSTEM

Bradford O. Van Ness, Paradise Valley, Ariz., assignor to Engineered Systems, Inc., Tempe, Ariz.

Filed Oct. 6, 1976, Ser. No. 729,992
Int. Cl.[2] G06K *17/00, 15/00*
U.S. Cl. 235—419 8 Claims



1. A document-controlled automatic dispensing system for controlling the dispensing of products from a plurality of dispensers, including in combination:

document reading means for reading data from a document inserted therein to control the dispensing system;

means for selecting a particular one of said plurality of dispensers from which products are to be dispensed in response to insertion of a document in said reading means;

validity check means coupled with said reading means for verifying the validity of documents inserted therein and further coupled with said dispensers for enabling said dispensers for the dispensing of products therefrom in response to a predetermined output from said validity check means indicative of a valid document;

first storing means uniquely associated with each of said plurality of dispensers and enabled by said selecting means for temporarily storing identifying data from a document inserted in said document reading means;

second storing means uniquely associated with each of said plurality of dispensers for temporarily storing data representative of the quantity of product dispensed therefrom;

switch means for each dispenser operated upon termination of the dispensing of product therefrom;

transaction recording means; and

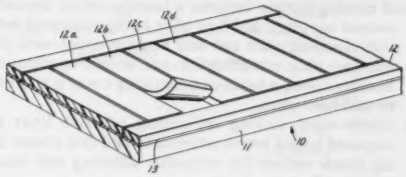
data transfer means coupled with said first and second data storing means and with said switch means and responsive to operation of said switch means for transferring said temporarily stored data from said first and second data storing means to said transaction recording means.

4,085,314
ENCODABLE RETROREFLECTIVE SHEETING

Thomas E. Schultz, Roseville, and Peter W. Schuchardt, May Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 9, 1976, Ser. No. 656,600
Int. Cl.[2] G06K *19/06*
U.S. Cl. 235—487 1 Claim

1. Elongate sheet material wound onto a storage roll and useful to form a coded retroreflective mark, said sheet material comprising a retroreflective base sheet having a planar front face and an opaque flexible polymeric cover film removable adhered over said planar front face by a layer of pressure-sensitive adhesive, said film being cut along a plurality of lines in a pattern that forms a plurality of contiguous parallel sections that are aligned along the longitudinal axis of the sheet material, comprise sections having an identical size and shape, and are individually removable to expose the portion of the retroreflective base sheet underneath the section, the sections being arranged in a predetermined pattern such that removal of one

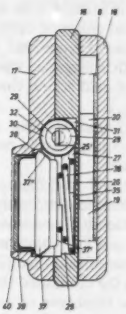


or more different sections provides different codes that may be read and distinguished by photoscanning equipment.

4,085,315
LIGHT CONNECTABLE WITH A KEY

Heinz Wolter, Stadtwaldgurtel 4, 5000 Cologne 41, Germany, and Brigitte Wolter, Cologne, Germany, assignors to Heinz Wolter, Cologne, Germany

Filed Feb. 12, 1976, Ser. No. 657,397
Claims priority, application Germany, Jun. 26, 1975, 2528498
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—116 5 Claims



1. A light and key combination adapted to be connected in a housing together, and receiving an incandescent bulb and battery, comprising

a key having a handle with a surface formed with surface projections and a single hole therein and a key shank joined to said handle,

a housing adapted to receive the battery and the bulb therein, said housing includes,

a base plate and a clamping plate coordinated thereto, the latter defining an outer peripheral thickened edge substantially of the same peripheral size but larger than that of said handle of said key,

at least two pins integral with and extending on opposite sides of said base plate, said thickened edge of said clamping plate is formed with openings in which said pins of said base plate are aligned and inserted in a coordinated condition of said base plate and said clamping plate,

said thickened edge of said clamping plate abutting said base plate in said coordinated condition, said thickened edge defining a recess larger in surface area than that of said handle of said key and defining a slot transferring into and communicating with said recess for passage of said key shank through said slot, said slot formed wider than said key shank,

said clamping plate defining a first planar clamping cheek surface in said recess enlarged in surface area relative to said handle of said key,

said base plate including a second planar clamping cheek surface spaced parallel and opposite to said first planar

clamping cheek surface, said key handle being disposed in said recess between said first and second planar clamping cheek surfaces,

said housing further includes a housing cover formed with second openings, said base plate being positioned between said clamping plate and said housing cover, said pins on said base plate extending into said second openings in said housing cover, whereby said housing cover is coordinated to said base plate,

a double-sided sticking self-sealing adhesive layer means disposed in said recess adhered to said first planar clamping cheek surface for releasably adhering said handle of said key thereto,

releasable clamping means for releaseably clampingly pressing together said base plate and said clamping plate and said housing cover, as well as said first clamping cheek surface with said adhesive layer means thereon against said handle of said key, said handle with said surface projections being pressed into said adhesive layer means thereby clamping said key pressingly against said self-sealing adhesive layer means, whereby said key is non-rotatably secured in said housing,

said base plate is formed with an enlarged bore,

said clamping means comprises a single screw having a threaded shank extending through said single hole of said handle of said key and through said enlarged bore of said base plate,

said housing cover is formed with a collar complementarily projecting into said enlarged bore of said base plate terminating therein spaced from said handle of said key and being formed with a threaded opening in said collar, said threaded shank of said screw threadedly engages in said threaded opening,

said base plate and said housing cover are formed with recess means for cooperatively receiving the bulb and the battery therein, and

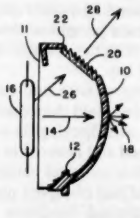
said housing cover and said clamping plate have substantially the same thickness and outer peripheral shape, and said base plate extends therebetween in a direction opposite than that of said key shank and is formed with a slot therein, said recess of said clamping plate having a thickness smaller than the combined thickness of said handle of said key and the thickness of said self-sealing adhesive layer means.

4,085,316

PHOTOGRAPHIC FLASH DEVICE

Peter T. Quinn, Littleton, Colo., assignor to Rollei of America, Inc., Littleton, Colo.

Filed Dec. 17, 1975, Ser. No. 641,478
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—16 **9 Claims**



1. Apparatus for use with photographic flash equipment including a source of light associated with a camera, for providing a bounce flash from a nearby surface to photograph a subject comprising:

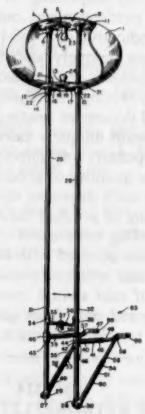
a light diffusing dome shaped member including means for removably attaching the member to the photographic flash equipment between the source of light and a subject to be photographed for providing a first part of the light emitted from the source of light to pass through said member in a first general direction to directly illuminate the subject to be photographed, said member having a sole portion which is substantially less light diffusing for directing a second part of the light emitted from the source of light directly through said member in a single second general direction away from the subject to be photographed for reflecting said second part of light from a nearby surface to indirectly illuminate the subject to be photographed, said portion located for a positioning of the camera for causing said second part of the light to bounce solely from a surface above the subject during photographing whereby the subject appears to be illuminated from above and shadows are formed to give a more natural appearance of the subject.

4,085,317

MOTORCYCLE SAFETY LIGHT

Oliver M. Mithoff, 3701 Bissonet Dr., Metairie, La. 70003

Filed Oct. 22, 1976, Ser. No. 734,890
Int. Cl.[2] B62J *5/00*
U.S. Cl. 362—72 **8 Claims**



1. A safety light and associated support for motorcycles, comprising:

a. a pair of adjustable, structural sub-frames rigidly attachable to the rear frame portion of a conventional motorcycle, each of said sub-frames being attachable to the side rear portion of said motorcycle, the attachment of said sub-frames to said motorcycle being connected at least partially to the rear axle and the rear shock absorber of said motorcycle;

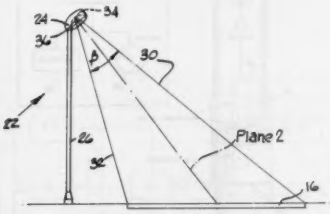
b. a pair of columns, rigidly supported in a substantially verticle position by said sub-frames, each of said columns being associated with and supported by each of said respective sub-frames; and

c. a spherical, lighted globe, rigidly affixable to said pair of columns in an elevated poisition above said frame.

4,085,318
LUMINAIRE AND LUMINAIRE REFLECTOR FOR USE IN AN OFF-THE ROADWAY LIGHTING ARRANGEMENT

Herbert Arnold Odle, Newark, Ohio; Donald Edward Ruehl, Belle Mead, N.J.; Jan Shadwick; Daryl Dean Sullivan, both of Newark, Ohio, and Dale Eugene Welty, Christiansburg, Va., assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 462,838, Apr. 22, 1974, abandoned.
This application Apr. 11, 1977, Ser. No. 801,495
Int. Cl.[2] F21S *1/10*
U.S. Cl. 362—217 **14 Claims**



1. An arrangement for lighting a straight section of a roadway having spaced-apart parallel curbs, comprising:

(a) a luminaire including

(i) a reflector having first and second side-by-side light-reflective surfaces, each of which is defined by a segment of a paraboloid of revolution, said surfaces having a common focal point located on the intersecting line of two intersecting planes which are normal to one another and respective first and second parabolic axes, said first axis lying on a first one of said planes and extending forwardly of and past said second surface at an acute angle with said second plane and said second axis lying on said first plane and extending past said first surface at an acute angle with said second plane,

(ii) means for supporting said reflector,

(iii) a linear light source positioned to extend substantially along the intersection of said two planes and through said focal point,

(iv) means for supporting said light source, and

(v) means for refracting light directly from said source and light reflected from said reflective surfaces; and

(b) means for supporting said luminaire in a position above and a substantial distance to one side of the curbs of said roadway such that said first plane, if extended, would intersect said roadway in a direction parallel to said curbs.

4,085,319
SPATIAL-MULTIPLEX, SPATIAL-DIVERSITY OPTICAL COMMUNICATION SCHEME

Paul H. Deitz; Gary L. Durfee, both of Bel Air, and Stephen S. Wolff, Baltimore, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 1, 1977, Ser. No. 764,622
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **10 Claims**

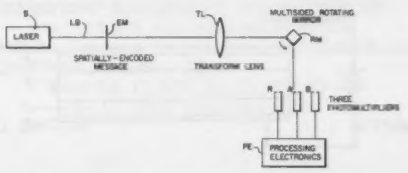
1. An optical communication system for transmitting coded message bits comprising:

a source of coherent radiation for transmitting a beam of light along an optical path;

means for spatially phase modulating said beam of light;

coding means in said optical path for modulating said beam of light to generate a selected spatial amplitude pattern through a cross section of said beam, the code corresponding to said selected spatial amplitude pattern and forming a message bit therein;

means for detecting the amplitude of said pattern in at least two positions separated by a predetermined distance

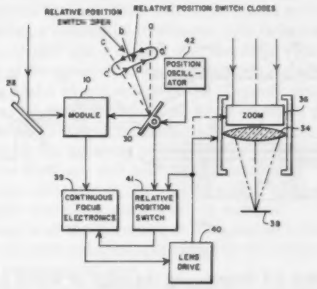


through the cross section of said beam to determine the presence or absence of said message bit.

4,085,320
AUTOMATIC FOCUS SYSTEM WITH LOSS OF CORRELATION INHIBIT

Dennis J. Wilwerding, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 7, 1976, Ser. No. 730,483
Int. Cl.[2] G01F *1/20*
U.S. Cl. 250—201 **10 Claims**



1. An automatic focusing system comprising:

primary optical means;

spatial correlation range sensing means for producing a time varying correlation signal, the amount of variation of which changes with different illuminations, different contrasts and different scene compositions;

positioning means for adjusting the position of the primary optical means in accordance with the time varying correlation signal; and

inhibit means for inhibiting the positioning means from adjusting the position of the primary optical means when the time varying correlation signal lacks a predetermined amount of variation.

4,085,321
MULTI-PHASE PHOTOACTIVATED SWITCH

Philip O. Sliva, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

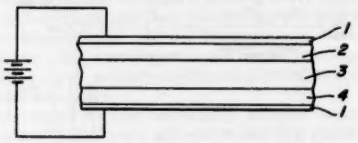
Filed Jun. 8, 1976, Ser. No. 694,124
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—211 R **19 Claims**

1. A multiphase photoactivated device comprising, in combination, two electrodes at least one of which is substantially light or radiation permeable, the two electrodes being oppositely and externally arranged in a field circuit with respect to

(1) a field or voltage-activated electrical device, and

(2) a switching element consisting essentially of at least one electron- or hole-transport material and at least one photoconductive material; the ratio in thickness of the transport material to the photoconductive material being about 2:1

to 400:1, said materials being functionally independent and intimately arranged with respect to each other, while the



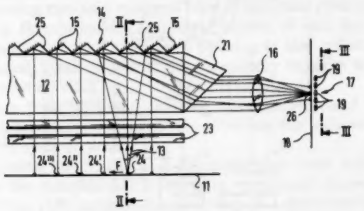
switching element as defined is arranged in series in the field circuit in proximity to a light or radiation-permeable electrode.

4,085,322

OPTICAL APPARATUS

Erwin Sick, Icking, Germany, assignor to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik, Germany

Filed Jul. 15, 1976, Ser. No. 705,656
Claims priority, application Germany, Jul. 21, 1975, 2532603
Int. Cl.[2] G02B 5/14
U.S. Cl. 250—227 **17 Claims**



1. Apparatus for determining the angle at which light from a light spot linearly scanning a monitored surface is reflected by the surface, the apparatus comprising: a light conducting rod having a substantially rectangular cross-section, extending in the direction of the light spot scanning direction, and positioned so that light from the spot reflected by the surface strikes the rod; a plurality of serially arranged mirrors extending in the scanning direction and having like angular inclination relative to the surface, the mirrors being positioned to receive and reflect light from the spot striking the rod; an optical system including focusing lens means positioned to receive light reflected by the mirrors and imaging such light in a focal plane of the lens means; and light detecting means disposed in said focal plane and surrounding a focal point of the lens means for detecting such imaged light and for determining the position of such imaged light relative to said focal point, whereby an angular divergence of light from the spot reflected by the surface due to surface irregularities results in corresponding offsets of the imaged light relative to said focal point for the detection of such irregularities.

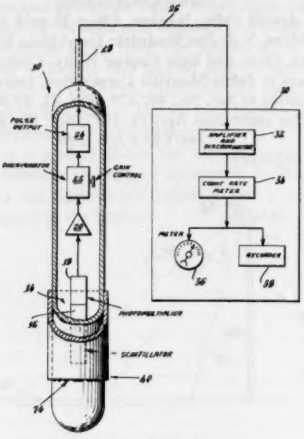
4,085,323

CALIBRATOR FOR RADIOACTIVITY WELL LOGGING TOOLS

Ronald E. Turcotte, West Redding, Conn., and Robert H. Hunt-Grubbe, Devizes, England, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,607
Int. Cl.[2] G01D 18/00; G21G 4/06
U.S. Cl. 250—252 **24 Claims**

1. A portable calibrator for radioactivity logging tools having a substantially cylindrical housing adapted to be moved in a borehole and a radiation detector carried by said housing, said calibrator comprising a sleeve arranged to encircle the



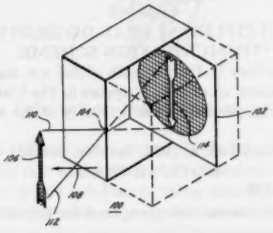
portion of said housing that carries the radiation detector, and a radioactive material distributed inside said sleeve.

4,085,324

IMAGING BY POINT ABSORPTION OF RADIATION

Alfonso Zermeno; Lee M. Marsh, Jr., and James M. Hevezi, all of Houston, Tex., assignors to The University of Texas, Houston, Tex.

Continuation-in-part of Ser. No. 601,233, Aug. 1, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,634
Int. Cl.[2] G03B 5/17
U.S. Cl. 250—320 **8 Claims**

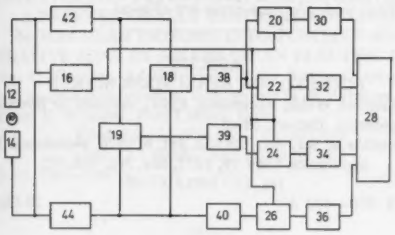


1. Apparatus for producing an image comprising:
a source of radiation,
a receptor responsive to the radiation,
at least one point absorber located between said source and said receptor not attached thereto, said absorber being opaque to said radiation and small enough to provide a focal ratio of at least 100 to 1.

4,085,325
METHOD AND CIRCUIT FOR DETERMINING THE QUENCH CORRECTED COUNTING EFFICIENCY OF LIQUID SCINTILLATION SAMPLES

Khaled Atallah, Horwarthstrasse 17, D-8000 Munich 40; Fritz Berthold, Engelsbranderstrasse 12, D-7540 Neuenburg; Wolfgang Kolbe, Schillerstrasse 25, D-7547 Wildbad; Peter Rauschenbach, Hittostrasse 6, and Helmut Simon, Egilbertstrasse 31, both of D-8050 Freising, all of Germany

Filed May 12, 1976, Ser. No. 685,894
Claims priority, application Germany, May 16, 1975, 251904
Int. Cl.[2] G01T *1/00*
U.S. Cl. 250—328 37 Claims



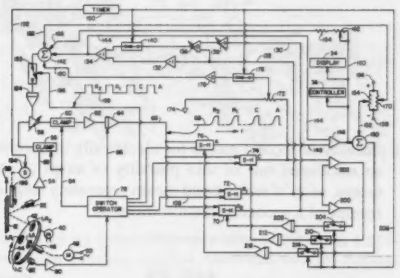
1. A method of determining the quench corrected counting efficiency ZA of electron emitting samples having an undetermined proportion of chemical and color quenching in a liquid scintillation counter using an external standard, by measuring in two different pulse height ranges 1 and 2 counting rates $^2E_1^e$ and $^2E_2^e$ of the sample together with the Compton spectrum caused by the external standard from coincident and additionally arithmetically combined output signals of at least two measuring transducers directed to the sample from different directions, and establishing therefrom by quotient formation the gross ESCR value $^2E_1^e/^2E_2^e$ from which the counting efficiency ZA is derived with the aid of a standardized ZA vs. ESCR threshold curves, characterized in that,

in an allocated pulse height range 3 a counting rate $^2E_3^e$ of the sample is measured together with the Compton spectrum caused by the external standard and in an allocated pulse height range 4 a counting rate $^1E_4^e$ of the sample is measured together with the Compton spectrum caused by the external standard and that therefrom the gross R value $^2E_3^e/^1E_4^e$ is formed, and with the aid of a standardized R-ESCR dependency field between threshold functions of an R-ESCR dependence for pure color quenching and an R-ESCR dependence for pure chemical quenching the point associated with the ESCR value formed as well as with the R value formed is determined, in that with the ESCR value formed in the standardized R-ESCR dependency field the ratio of the R differences between the difference of the R value of one of the threshold functions on the one hand and the difference of the R values of both threshold functions on the other hand is determined, and in that with the ESCR value formed the quench corrected counting efficiency ZA is formed with the aid of a standardized ZA vs. ESCR dependency field between threshold functions for pure color quenching and for pure chemical quenching by interpolation according to the ratio of the R differences determined.

4,085,326
RADIATION REFLECTION METHOD AND APPARATUS PARTICULARLY FOR GAUGING MATERIALS EXHIBITING BROADBAND ABSORPTION OR SCATTERING, OR SIMILAR EFFECTS

Paul Williams, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Oct. 19, 1976, Ser. No. 734,007
Int. Cl.[2] G01T *1/16;* G01J *3/00*
U.S. Cl. 250—339 46 Claims



1. The method of gauging a property of a plastic film or other material having a front side, a back side, and characteristics including a substantial transparency to radiation at a reference wavelength and a degree of transparency depending on the value of the property at an absorption wavelength, so as to provide a useful measurement of the property in the presence or absence of detrimental effects such as those caused by a broadband absorbing or scattering substance in the material or variations in the apparent reflectivity of one or both of the surfaces on the front and back sides, comprising

directing radiations at the reference and absorption wavelengths into the front side of the material,

detecting from the front side at the specular reflection angle the reflected radiation including the reference and absorption wavelengths, and

producing from the detected radiations an instrument response wherein the effects of the reference and absorption wavelengths reflected from the front side have been selectively subdued, whereby the response is indicative of the value of the property primarily as a function of the reference and absorption wavelengths reflected from the back side of the material.

4,085,327
DIRECT CHARGE READOUT ELECTRON RADIOGRAPHY APPARATUS WITH IMPROVED SIGNAL-TO-NOISE RATIO

Robert K. Swank, and Kei-Hsiung Yang, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

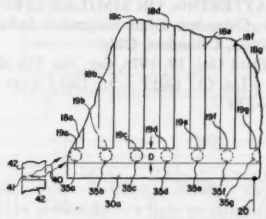
Filed Jan. 14, 1977, Ser. No. 759,427
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 39 Claims

1. An improved direct charge readout electron radiography apparatus of the type having first electrode means receiving differentially-absorbed radiation, means for receiving the radiation passing through said first electrode for converting said radiation to a pattern of charged particles, second electrode means spaced from said first electrode means beyond said converting means for receiving said pattern of charged particles and means for reading the image of charged particles from said second electrode, wherein the improvement comprises said second electrode means including:

a plurality of substantially parallel elongated strips of a transparent and conductive material, each strip having a first end;

lead means spaced from said first end of each of said plurality of strips;

first means overlaying at least said plurality of strips for storing said charge image until receipt of a first radiation stimulus; and



a plurality of second means for electrically connecting only an associated one of said plurality of strips to said lead means, each of said second means separately responsive to receipt of a second radiation stimulus.

4,085,328

X-RAY EXAMINING DEVICE

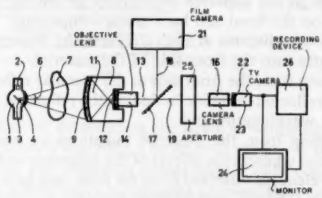
George Leendert Adriaan Monte, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,203

Claims priority, application Netherlands, Oct. 20, 1975, 7512256

Int. Cl.² G21K *1/04*

U.S. Cl. 250—416 TV **4 Claims**



1. In an X-ray examining device comprising an X-ray source; an X-ray image intensifier tube disposed to receive radiation from said source which functions to produce optical image radiation in response thereto; optical system means, having an optical axis, for conducting said image radiation to recording means and a beam stopping aperture disposed about said optical axis between said intensifier tube and said recording means; the improvement wherein said aperture comprises a plurality of sector-like laminations, symmetrically disposed about said optical axis, each of said laminations being rotatable about separate axes which intersect said optical axis in a direction perpendicular thereto.

4,085,329

HARD X-RAY AND FLUORESCENT X-RAY DETECTION OF ALIGNMENT MARKS FOR PRECISION MASK ALIGNMENT

John H. McCoy, Newbury Park, and Paul A. Sullivan, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 3, 1976, Ser. No. 682,432

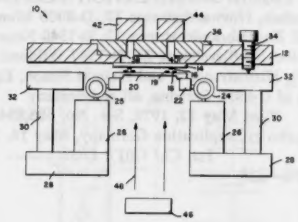
Int. Cl.² G01N *21/34*

U.S. Cl. 250—492 A **3 Claims**

1. A process for aligning a reference area on a mask with a reference area on a substrate which includes:

(a) bringing the substrate and mask toward alignment of said reference areas on their respective surfaces,

(b) illuminating said reference area on said substrate to cause it to fluoresce, and



(c) sensing the quantity of fluorescent x-rays from said reference area on said substrate as indicative of the extent to which said reference areas are aligned.

4,085,330

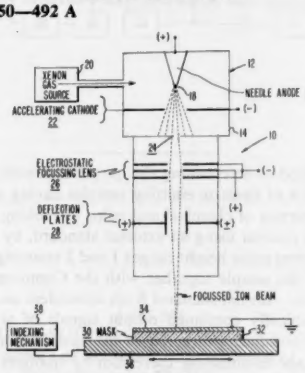
FOCUSED ION BEAM MASK MAKER

John Edmond Wolfe, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 703,633, Jul. 8, 1976, abandoned. This application May 19, 1977, Ser. No. 798,392

Int. Cl.² H01J *37/08*

U.S. Cl. 250—492 A **20 Claims**



1. In a method of making a pattern on a photolithographic mask for semiconductor devices wherein the mask has a metallic coating on a surface of a transparent substrate, the improvement comprising:

using a field ion source to produce a beam of ions;

accelerating the ions; and

directly bombarding the metallic coating on the mask substrate with the accelerated ions to form openings in the coating in a desired pattern.

4,085,331

SOURCES OF NUCLEAR RADIATION

Malcolm Thackray, Sutherland, Australia, assignor to Australian Atomic Energy Commission, Coogee, Australia

Filed Sep. 27, 1976, Ser. No. 727,118

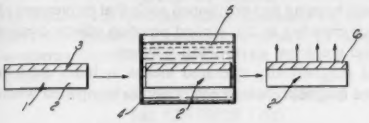
Claims priority, application Australia, Oct. 30, 1975, 3781/75

Int. Cl.² G21G *4/04*

U.S. Cl. 250—493 **14 Claims**

1. A method of forming a substantially uniform source of nuclear radiation comprising taking a body having a surface portion extending over an area and including an approximately uniform dispersion over the area of a material characterized by the property of being convertible to become a substantially uniform source of nuclear radiation, and substantially uniformly treating said surface portion with nuclear radiation to

convert a substantially uniformly dispersed proportion of said material and to leave the converted material firmly bound to



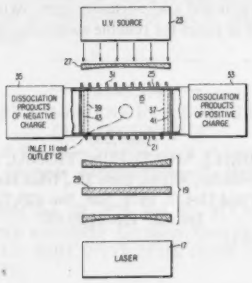
said body, whereby said surface portion becomes a substantially uniform source of nuclear radiation.

4,085,332

APPARATUS FOR EXTRACTION AND SEPARATION OF A PREFERENTIALLY PHOTO-DISSOCIATED MOLECULAR ISOTOPE INTO POSITIVE AND NEGATIVE IONS BY MEANS OF AN ELECTRIC FIELD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Horst E. Wilhelm, Fort Collins, Colo.

Filed Jun. 3, 1976, Ser. No. 692,413
Int. Cl.² B01K *1/00;* **B01D** *59/00*
U.S. Cl. 250—528 **4 Claims**



2. Apparatus for separating and extracting isotopes of a gaseous mixture containing a first isotope species having a first excitation energy level and a second isotope species having an excitation level different from the first excitation level comprising:

a laser for subjecting the gaseous isotope mixture to a beam tubed to match the energy levels of the first isotope and which has sufficient power density to directly dissociate this molecular isotope by sequential absorbtion of *n* photons into changed dissociation products but not the second molecular isotope;

a magnetic field for confining the charged dissociation products in the mixture;

an electric field means for selectively moving dissociation products of opposite charge in the mixture in opposite directions;

one grid means having a first region characterized by a first potential difference for accelerating the dissociation products of positive charge in the mixture through said first region;

another grid means having a second region characterized by a second potential difference for accelerating the dissociation products of negative charge in the mixture through said second region;

a first collection means for collecting the dissociation products of positive charge; and,

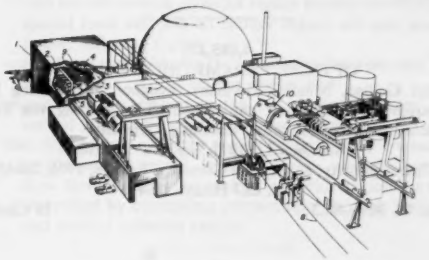
a second collection means for collecting the dissociation products of negative charge.

4,085,333

CONSERVATION OF ELECTRICAL ENERGY

Frederick G. J. Grisé, 87 Main St., Osterville, Mass. 02655, and Walter Lovell, 348 Mountain Rd., Wilbraham, Mass. 01095

Filed Feb. 17, 1976, Ser. No. 658,698
Int. Cl.² F02C *7/02*
U.S. Cl. 290—2 **17 Claims**



1. An electricity generating apparatus comprising a generator which can produce surplus electrical energy during off peak hours,

in combination with a heat retaining magma that conducts electricity directly from said generator and being heated thereby,

a series of passages extending through said magma and a source of water selectively entered into said passages, the water thereby being transferred into steam,

and means receiving the steam produced by said magma to generate additional electricity to increase the total supply of electrical energy of the entire apparatus during peak demand periods,

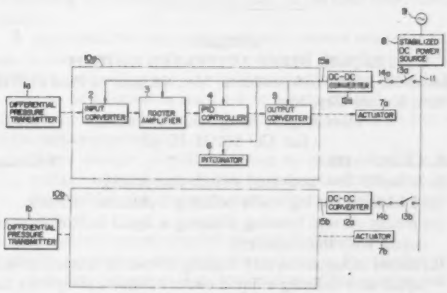
the material of said magma comprises an electricity conducting material throughout the aggregate, said surplus electrical energy being conducted directly to and through the aggregate.

4,085,334

ELECTRONIC SYSTEM FOR PROCESS INSTRUMENTATION AND CONTROL

Katsuhiko Shinohara; Yoshinori Kuramochi; Tetsuo Suehiro, and Ichiro Matsubara, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,759
Claims priority, application Japan, Oct. 9, 1974, 49-115500
Int. Cl.² H02M *7/20*
U.S. Cl. 307—11 **39 Claims**



1. In a plurality of electronic instrumentation and control systems each comprising at least one input signal converter for converting process input signals into uniform electrical signals and at least one measuring instrument connected to said converter, an electronic system for process instrumentation and control comprising a DC power source common to said elec-

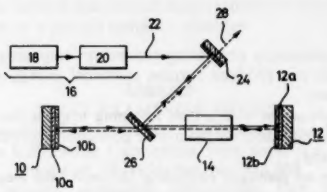
tronic instrumentation and control system, current limiter provided for said instrumentation and control systems and a DC insulating device provided for each of said electronic instrumentation and control systems, said converter and said measuring instrument being impressed with at least a DC positive and a DC negative voltage from said common DC power supply through said current limiter and through said devices.

4,085,335

OPTICAL PARAMETRIC DEVICE

Ernst Guilino, Munich, Germany, assignor to Garching Instrumente-Gesellschaft zur industriellen Nutzung von Forschungsergebnissen mbH, Garching, Germany

Filed Jan. 27, 1977, Ser. No. 763,108
Claims priority, application Germany, Feb. 18, 1976, 2606526
Int. Cl.[2] H02M *5/04*
U.S. Cl. 307—88.3 **10 Claims**



1. Tunable optic parametric device having
a source of primary radiation (**16**);
an optical resonator including an optically non-linear medium (**14**) and mirrors (**10**, **12**; **10'**, **11'**, **12'**) located at either side of the medium and in the path of radiation passing through the medium;
coupling means (**26**) to couple primary radiation of predetermined frequency into the resonator and to extract secondary radiation from the resonator at a frequency which is shifted with respect to the frequency of the primary radiation and arising due to parametric interaction of the primary radiation in the resonator
the coupling means (**26**, **26'**) comprising at least one dichroic mirror (**26**, **26'**) located in the path of radiation of the optical resonator at an inclination with respect to said path and having the characteristic of being highly reflective for radiation of the wavelength of the primary radiation and being highly transmissive to radiation of the wavelength of the secondary radiation.

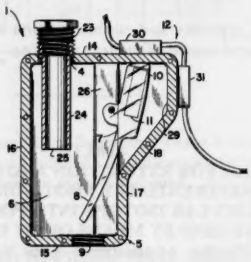
4,085,336

LIQUID FLOW ACTIVATED SWITCH

Charles M. Miles, Independence, Mo., assignor to Paul F. Walters, Kansas City, Mo.

Filed Aug. 9, 1976, Ser. No. 712,929
Int. Cl.[2] H01H *35/40*
U.S. Cl. 307—118 **6 Claims**

1. A liquid flow activated switch comprising:
(a) a housing having walls defining a chamber therein;
(b) means on said housing defining a liquid inlet communicating with the chamber;
(c) means mounted on said housing in spaced relation to said liquid inlet defining a liquid outlet commnicating with the chamber;
(d) a switch member pivotally mounted in the chamber and having a first portion and a second portion; said switch member first portion being positioned adjacent said liquid inlet whereby liquid entering the chamber through said liquid inlet impinges upon the same and pivots said switch member from a first to a second position;
(e) a magnet mounted on said switch member second portion and movable therewith;
(f) an electrical circuit having magnetically operated means on said housing and positioned such that movement of said switch member to the second position effects completion of said electrical circuit; and wherein
(g) said magnetically operated means includes a normally-closed magnetic switch positioned to be opened when said



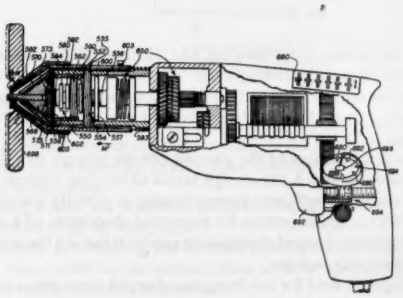
magnet and switch member are in said first position thereby breaking said electrical circuit, and a normally-open magnetic switch positioned to be closed when said magnet and switch member are in said second position thereby completing said electrical circuit; said normally-closed switch and said normally-open switch being interconnected in series for reliable switching of said electrical circuit.

4,085,337

ELECTRIC DRILL MULTI-FUNCTIONAL APPARATUS

Wolfgang W. Moeller, 4 Glen Cove Dr., Glen Head, N.Y. 11545

Filed Oct. 7, 1975, Ser. No. 620,722
Int. Cl.[2] H01H *21/00*
U.S. Cl. 307—115 **7 Claims**

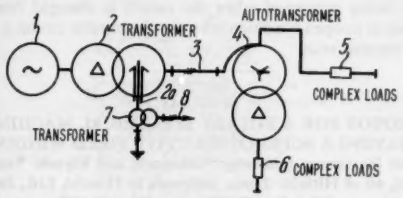


1. In an electric drill multi-functional apparatus having means for effecting different functions, said apparatus having a housing for an electric motor and a power shaft which transmits power for said functions, the improvement for automatically actuating said functions sequentially which comprises an electric circuit including a source of electricity, said circuit having in parallel at least one first switch in series with first electromechanical apparatus corresponding to a first function of said multi-functions and at least a second switch in series with a second electromechanical apparatus corresponding to a second function of said multi-functions, a single switch engaging means for sequentially engaging said first switch and said second switch, and mechanical means for moving said single switch engaging means to actuate said first switch and thereafter to actuate said second switch.

4,085,338
HIGH-VOLTAGE NETWORK FOR AREAS WITH HIGH RATE OF ICING

Georgy Andreevich Genrikh, ulitsa Chekistov 10, kv. 3; Leonid Alexeevich Nikonets, Khasansakya ulitsa 8, kv. 4, and Natalia Georgievna Genrikh, ulitsa Chekistov 10, kv. 3, all of Lvov, U.S.S.R.

Filed Feb. 20, 1976, Ser. No. 659,795
Int. Cl.[2] H02B *1/00*
U.S. Cl. 307—147 **36 Claims**

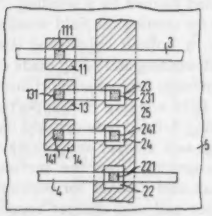


1. A high-voltage network for areas with high rates of icing comprising: load current circuits including a generator, a first transformer, aerial power transmission lines and complex loads; a second transformer for melting of ice coatings with its primary winding being connected in series with a load current circuit and the secondary winding of said second transformer being connected to conductors of one of said aerial power transmission lines.

4,085,339
CIRCUIT ARRANGEMENT IN A COMPLEMENTARY CHL TECHNIQUE

Karl Goser, and Ruediger Mueller, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 29, 1975, Ser. No. 617,965
Claims priority, application Germany, Oct. 23, 1974, 2450408
Int. Cl.[2] H01L *27/12;* **H03K** *19/08, 19/22*
U.S. Cl. 307—213 **8 Claims**

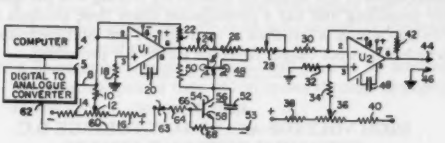


1. A current hogging logic circuit arrangement comprising:
a body of semiconductor material having a first portion of a first conductivity type and a second portion of a second conductivity type;
a first multi-collector bipolar transistor formed in said first portion of said body, said first portion of a first conductivity type forming the base region of said first transistor, a first emitter region of second conductivity type formed in said first portion, a first output collector region of second conductivity type formed in said first portion spaced from said first emitter region, and a first control collector region of second conductivity type formed in said first portion, said first control collector region located between and spaced from said first emitter region and said first output collector region, a second multi-collector bipolar transistor formed in said second portion of said body, said second portion of said second conductivity type forming the base region of said second transistor, a second emitter region of first conductivity type formed in said second portion, a second output collector region of said first conductivity type formed in said second portion spaced from said second emitter region, and a second control collector region of first conductivity type formed in said second portion spaced from said second emitter region, said second control collector region located between and spaced from said second emitter region and said second output collector region;
means for forward-biasing the pn junction between said first portion and said first emitter region; and
means for forward-biasing the pn junction between said second portion and said second emitter region,
said first control collector region being directly connected to said second output collector region, whereby current flow through said first output collector region may be controlled by controlling current flow through said second control collector region.

4,085,340
RANGE SWITCHING TRANSIENT ELIMINATOR CIRCUIT

Emery Salesky, Denville, and Kent W. Luehman, Parsippany, both of N.J., assignors to Hewlett-Packard Co., Palo Alto, Calif.

Filed Apr. 14, 1976, Ser. No. 676,848
Int. Cl.[2] H03K *5/08;* **H03G** *3/30*
U.S. Cl. 307—237 **3 Claims**



1. An operational amplifier having positive and negative inputs and an output, a resistor connected between said output and said negative input, bias supply means coupled to said positive input, a plurality of resistors connected in series to said negative input, a switch connected in shunt with at least one of said series resistors, said switch being a field effect transistor having source, drain and gate electrodes, means connecting said source-drain path in parallel with at least one said series resistor, a bias resistor connected between one of the source and drain electrodes and said gate electrode, a source of direct current potential, a capacitor connected between said gate electrode and said source of potential, and a transistor, means connecting its collector-emitter path in parallel with said capacitor.

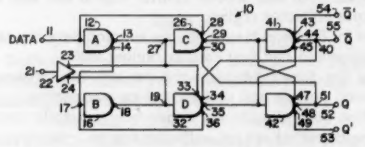
3. Apparatus for producing a direct current reference voltage in response to a voltage control signal that changes slowly between values that are inversely proportional to the amplification to be effected in response to a gain control signal that changes quickly between a value for low gain and a value for high gain comprising,
a direct current amplifier having an input to which said voltage control signals can be connected and an output from which the direct current reference voltage may be derived,
gain control means coupled to said amplifier,
means coupled to said gain control means for causing it to delay the increases in gain of said amplifier in response to change in said gain control signal from a value for low gain to a value for high gain, and
means coupled to said gain control means for causing it to quickly decrease the gain of said amplifier in response to changes in said gain control signal from a value for high gain to a value of low gain,
thereby preventing the amplifier from having high gain when the voltage control signals have a high value.

4,085,341

INTEGRATED INJECTION LOGIC CIRCUIT HAVING REDUCED DELAY

John Robert Reinert, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1976, Ser. No. 752,484
Int. Cl.² H03K *19/08*
U.S. Cl. 307—247 R **7 Claims**



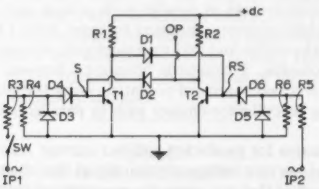
1. A D-type flip-fop being interconnected to provide at least one output having a reduced time delay, comprising: means for steering input data into the flip-flop; means for selectively gating the input data through the flip-flop, the means for selectively gating being coupled to the means for steering; means for receiving a clock pulse, the means for receiving selectively controlling the means for selectively gating; and means for providing an output storage latch, the means for providing having multiple outputs and being coupled to the means for selectively gating so that at least one of the multiple outputs is coupled to an output of the means for selectively gating whereby the at least one of the multiple outputs is a combination output of the means for selectively storing and the means for providing and has a propagation delay time through the flip-flop which is less than at least one of the multiple outputs which is a direct output from the means for providing.

4,085,342

HIGH VOLTAGE A.C. TO LOW VOLTAGE D.C. SWITCHING INTERFACE CIRCUIT

Derek J. Parkyn, Westerham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,854
Claims priority, application United Kingdom, Nov. 3, 1975, 45625/75
Int. Cl.² H03K *17/00, 3/286*
U.S. Cl. 307—260 **9 Claims**



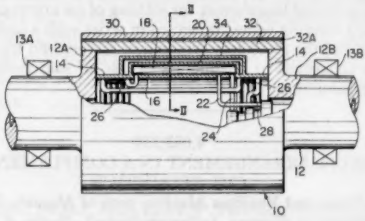
1. A circuit arrangement for producing a low voltage DC output signal at a first or second level dependent on the closed or open condition of a switch comprising, means connecting the switch to a high voltage AC source, a bistable circuit which provides the output signal at the first or second level when it is in a set or reset condition, respectively a first pulse train generating circuit having an input for connection to the a.c. source and a first potential divider, means connecting said switch between said input and one end of said first potential divider, diode elements connected between a tap on the first potential divider and an output of the first pulse generating circuit which is connected to a set input of the bistable circuit, a second pulse generating circuit having a second input for connection to the AC source and a second potential divider with one end of the second potential divider connected to the second input, and further diode elements connected between a tap on the second potential divider and an output of the second pulse generating circuit which is connected to a reset input of the bistable circuit, the two potential dividers having different potential ratios at their respective taps such that when the switch is changed from its open to its closed condition first and second pulse trains are applied respectively to the set and reset inputs of the bistable circuit, the pulses of both pulse trains having the duration of the same alternate half cycles of the a.c. source with the pulses of the first pulse train having steeper edges than the pulses of the second pulse train whereby the bistable circuit is set and remains set, only the second pulse train being generated when the switch is changed from its closed to its open condition whereby the bistable circuit is reset and remains reset.

4,085,343

ROTOR FOR A ROTARY ELECTRICAL MACHINE HAVING A SUPERCONDUCTIVE FIELD WINDING

Kunio Hasegawa; Hidetomo Nishimura, and Kiyoshi Yamaguchi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 2, 1976, Ser. No. 692,197
Claims priority, application Japan, Jun. 13, 1975, 50-70863; Jul. 9, 1975, 50-83424
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **12 Claims**



1. A rotor for a rotary electrical machine having a superconductive field winding, comprising a hollow rotor body including a shaft rotatably supported by bearing means, the superconductive field winding being arranged in the hollow portion of said rotor body and formed by a winding of superconductive wire, first means for cooling the field winding to an extremely low temperature, a hollow cylindrical damper disposed to surround the field winding and being made of a good electrical conductor, a cylindrical damper support disposed between said damper and the field winding for supporting said damper, a vacuum space being defined between said damper support and the field winding, said damper support having a plurality of protuberances projecting from the surface of said damper support to contact said damper for restricting heat flow between said damper and said damper support, said protuberances being elongated projections extending in the axial direction of said rotor body, and second means for circulating a cooling medium through interstices defined between said protuberances.

4,085,344

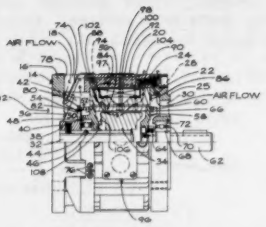
COOLING FOR MAGNETIC PARTICLE DEVICES

Gerald R. Eddens, St. Louis County, Mo., assignor to W. J. Industries, Inc., St. Louis, Mo.

Filed Oct. 6, 1976, Ser. No. 730,137
Int. Cl.² H02K *9/00*
U.S. Cl. 310—58 **12 Claims**

1. A magnetic particle device having relatively movable input and output members, said input and output members respectively having cylindrical surfaces positioned in radially opposed relationship forming an air space therebetween, means forming a chamber in the device that includes the air space between said relatively movable members, magnetic

particles positioned in said chamber, stationary electromagnetic means positioned outwardly of said members and of the air space therebetween, said electromagnetic means being energizable to establish a flux path that includes portions of said input and output members and the air space therebetween, said flux causing some of the magnetic particles to form in bands in the air space between said members whereby said flux path produces magnetic coupling therebetween, means journaling one of said relatively movable members for movement



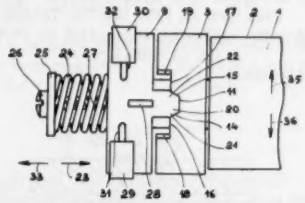
relative to the other, means in said device forming a path for the circulation of air adjacent to one end of said device, said path forming means including a shield member mounted on the stationary electromagnetic means and extending inwardly therefrom, and fan means on one of said relatively movable members adjacent to said one end and inwardly from the deflector member to circulate air through said air circulation path to cool the portions of the device adjacent thereto during operation of the device.

4,085,345

TORQUE-LIMITING STOP DEVICE

Jean Bull..t, Bonneville, France, assignor to Etablissements CARPANO & PONS, France

Filed Nov. 10, 1976, Ser. No. 740,715
Claims priority, application France, Nov. 19, 1975, 75 36255
Int. Cl.[2] H02K *7/12*
U.S. Cl. 310—117 **5 Claims**



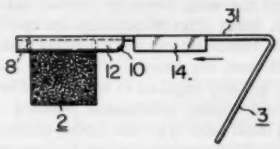
1. In a motor having a casing cooperating with elastic biasing means tending to angularly fix the casing in relation to a fixed support, a torque-limiting stop device actuable by a given rotation of the motor casing to control stopping of the motor when an opposing torque on a driving shaft of the motor exceeds a predetermined value, comprising two cooperating profiles, one in relief the other hollow, one fixed for rotation with the motor casing and the other fixed angularly with the fixed support, one of the cooperating profiles being provided on a mobile element movable by coaction of the cooperating profiles against the action of the biasing means in a direction secant to the direction of relative movement of the two profiles produced by said rotation of the motor casing, at least one of the cooperating profiles having at least one ramp, each hollow profile being extended by at least one bearing surface at least approximately perpendicular to the direction of movement of said mobile element.

4,085,346

BRUSH DEVICE FOR MINIATURE ELECTRIC MOTOR

Yuzuru Yoshida, Yamato, Japan, assignor to Aupac Kabushiki Kaisha, Yamato, Japan

Filed Dec. 9, 1976, Ser. No. 748,829
Claims priority, application Japan, Dec. 23, 1975, 50-174156
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—246 **17 Claims**



1. A brush device for miniature electric motor, which comprises in combination:

a. a brush holder made of a leaf spring having:
   1. a pair of flaps for holding a commutator brush, which are arranged in parallel each other along the longitudinal direction of a flat surface part of said brush holder, and which are formed by inwardly bending the side edge portions of said flat surface of the brush holder;
   2. guide means formed at a corner of each of said pair of flaps to facilitate insertion of said commutator brush; and
   3. a fitting part integral with said flat surface part of the brush holder to cause the same to be secured to the main body of said motor; and

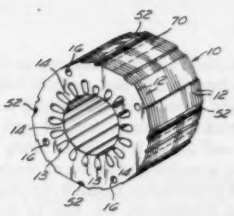
b. a commutator brush having a head part to be inserted between said pair of flaps of leaf spring through engaging means formed therein.

4,085,347

LAMINATED STATOR CORE

Kenneth Walter Lichius, Etowah, Tenn., assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1976, Ser. No. 649,859
Int. Cl.[2] H02K *1/12*
U.S. Cl. 310—259 **7 Claims**



1. A laminated magnetic core comprising a plurality of magnetic laminations arranged in abutting relation in a stack having opposite end surfaces, a circumferential side surface, and an axial bore adapted to receive a rotor member, said lamination defining interlaminar regions, each lamination having at least two spaced apart pressure points for receiving axially directed compressive forces applied to said end surfaces of said stack, said laminations being secured together in a unitary structure by partial saturation and penetration of said stack with a minute, predetermined amount of adhesive material disposed within a portion of said interlaminar regions, said portion constituting interlaminar bonding regions situated intermediate of and isolated with respect to each other and another portion of said interlaminar regions, said another portion constituting interlaminar regions of axial pressure concentration which surround said pressure points, said interlaminar bonding regions and said interlaminar regions of axial pressure

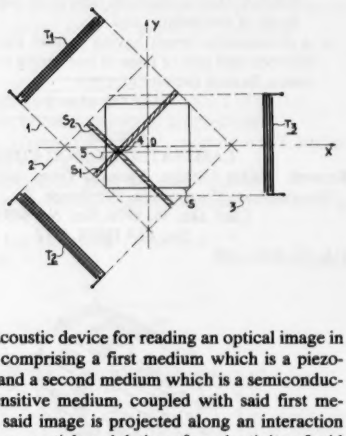
concentration constituting only part of said interlaminar regions, said axial pressure concentration regions and said interlaminar regions other than said interlaminar bonding regions being completely free of said adhesive material, said regions free of adhesive including interlaminar regions between said axial pressure concentration regions and said bore, said adhesive material being applied to preselected side surface areas of said core, said adhesive material entering between adjacent laminations and migrating therein by capillary action, the areas of application being circumferentially intermediate of said pressure concentration regions and extending axially along the length of said core, the amount of adhesive material being limited to the quantity required to sustain capillary migration only within said isolated interlaminar bonding regions, said amount being insufficient to sustain further capillary migration from said isolated interlaminar bonding regions into said interlaminar regions other than said interlaminar bonding regions.

4,085,348

ELECTROACOUSTIC DEVICE FOR READING AN OPTICAL IMAGE IN TWO DIMENSIONS

Bernard Munier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 14, 1976, Ser. No. 750,573
Claims priority, application France, Dec. 19, 1975, 75 39182
Int. Cl.² H01L *41/04*
U.S. Cl. 310—313 **10 Claims**



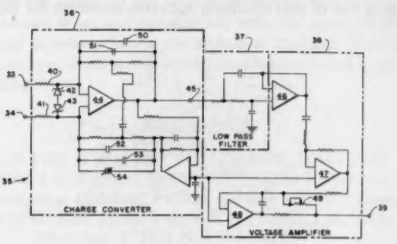
1. An electro-acoustic device for reading an optical image in two dimensions, comprising a first medium which is a piezoelectric medium and a second medium which is a semiconductive and photosensitive medium, coupled with said first medium and where said image is projected along an interaction surface, producing a spatial modulation of conductivity of said first medium, said piezoelectric medium carrying at least three electromechanical transducers, the first of said transducers generating a long elastic wave at the surface of said first medium, the duration of that wave being equal to at least twice the scanning time of the surface by an elastic wave, the second and the third of said transducers generating pulse-form elastic waves in two separate directions at the surface of said first medium, the intersection of said two directions defining an elementary interaction zone, said pulses being emitted with a period at least equal to the scanning time of one line of said interaction surface by said elementary zone, and with variable relative delays for ensuring the line-by-line scanning of said interaction surface by said elementary zone, the wave vectors of the three elastic waves generated by said transducers being such that the electrical fields associated with said three waves interact non-linearly in said second medium to give a resultant signal the wave vector of which is substantially zero, said device further comprising means for extracting said resultant signal.

4,085,349

PIEZO ELECTRIC TRANSDUCER FOR MEASURING INSTANTANEOUS VIBRATION VELOCITY

Johan T. Farstad, Sunbury, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Mar. 12, 1976, Ser. No. 666,355
Int. Cl.² H01L *41/04*
U.S. Cl. 310—319 **3 Claims**



1. A transducer for measuring velocity of vibrating bodies including:

an enclosure containing a piezo electric element maintained under compression between two seismic masses, one of said seismic masses being rigidly attached to the body under observation;

a pair of electrical conductors, each leading from said piezo electric element through a series resistor to an output terminal;

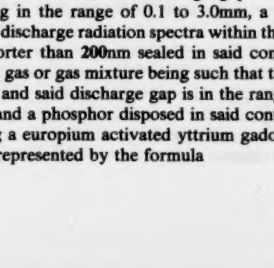
a cable connecting the said output terminals to the input terminals of a different charge converter, said charge converter being adapted to convert an electric charge into an alternating voltage having an amplitude corresponding to the instantaneous velocity of the body under observation.

4,085,350

GASEOUS DISCHARGE LIGHT EMITTING ELEMENT

Akiyasu Kagami, Ninomiya-machi; Takashi Hase, Fujisawa; Minoru Hiraki, Chigasaki; Junro Koike, Tokyo; Ryuya Toyonaga, Tokyo, and Takehiro Kojima, Tokyo, all of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed Oct. 29, 1976, Ser. No. 737,026
Claims priority, application Japan, Oct. 31, 1975, 75-131007
Int. Cl.² H01J *61/44*
U.S. Cl. 313—486 **8 Claims**



1. A gaseous discharge light emitting element comprising an air-tight transparent container, a pair of discharge electrodes provided in said container, the discharge gap between said electrodes being in the range of 0.1 to 3.0mm, a gas or gas mixture having discharge radiation spectra within the region of wavelength shorter than 200nm sealed in said container, the pressure of said gas or gas mixture being such that the product of the pressure and said discharge gap is in the range of 30 to 300 Torr.mm, and a phosphor disposed in said container, said phosphor being a europium activated yttrium gadolinium borate phosphor represented by the formula

$$\{[(Y_{1-x}Gd_x)_{1-z}B_z]_{1-y}Eu_y\}_2O_3$$

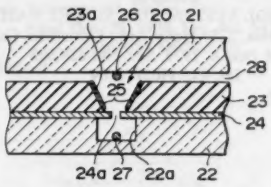
where $0 \leqq x \leqq 1$, $0.001 \leqq y \leqq 0.1$ and $0.25 \leqq z \leqq 0.75$.

4,085,351

GASEOUS DISCHARGE LIGHT EMITTING ELEMENT

Koichi Takahashi, Odawara; Kinichiro Narita, Chigasaki; Akiyasu Kagami, Ninomiya; Takashi Hase, Fujisawa; Yoshiyuki Mimura, Chigasaki; Yoshinori Tanigami, Odawara; Junro Koike, Machida; Ryuya Toyonaga, Ebina, and Takehiro Kojima, Kawasaki, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka and Nippon Hoso Kyokai, Tokyo, both of, Japan

Filed Jan. 24, 1977, Ser. No. 761,988
Claims priority, application Japan, May 26, 1976, 51-60808
Int. Cl.[2] H01J *61/18, 61/44*
U.S. Cl. 313—486 **9 Claims**



1. A gaseous discharge light emitting element comprising an air-tight at least partially transparent container, a pair of discharge electrodes provided in said container, the discharge gap between said electrodes being in the range of 0.1 to 3.0 mm, a gas or gas mixture having discharge radiation spectra within the region of wavelength shorter than 200nm sealed in said container, the pressure of said gas or gas mixture being such that the product of the pressure and said discharge gap is in the range of 30 to 300 Torr·mm, and a phosphor disposed in said container, said phosphor having a high radiation efficiency under vacuum ultraviolet ray excitation and comprising a manganese activated aluminate phosphor represented by the formula:

$$(M^{II}_{1-x}Mn_x)O{\cdot}zAl_2O_3$$

wherein M^{II} is selected from a group consisting of calcium, strontium, barium, magnesium and zinc, and x and z are numbers within the ranges of $10^{-3} \leqq x \leqq 7 \times 10^{-1}$ and $1 \leqq z \leqq 20$, respectively.

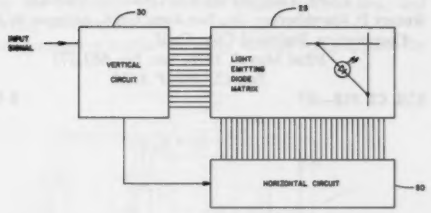
4,085,352

DIGITAL WAVEFORM ANALYZER

Richard Dickson Hilton, Rte. 2, Box 381-A, King George, Va. 22485

Filed Oct. 12, 1976, Ser. No. 731,169
Int. Cl.[2] G08B *5/36;* H04N *3/14*
U.S. Cl. 315—169 R **6 Claims**

1. A Digital Waveform Analyzer comprising:
an input signal;
a matrix of light emitting diodes wherein said LEDs are arranged in M columns and N rows;
a vertical circuit which converts said input signal to a one-of-N digital code thereby driving said LED matrix rows and which compares said input signal against a select voltage to produce a synchronize signal;
a horizontal circuit comprising:
a column driving circuit outputting one-of-M code for driving said LED matrix columns; and,
a sweep circuit comprised of:
a variable frequency oscillator;
a binary counter driven by said oscillator wherein the most significant bit of said counter is fed to said column driving circuit indicating if any LED column is to be illuminated, and wherein the remaining bits of said counter feed said column driving circuit indicating which, if any, LED column is to be illuminated; and,



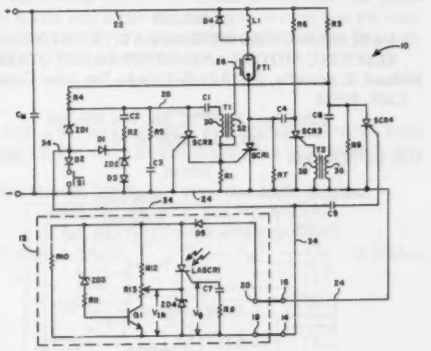
a synchronizing signal gate wherein said synchronize signal is gated with the most significant bit of said counter, said gate outputting a signal for clearing said counter and initiating a sweep; and
power means for supplying power to said vertical and horizontal circuits.

4,085,353

REMOTE SENSOR TRIGGER CIRCUIT

James R. Adams, Jr., and Dennis J. Wilwerding, both of Littleton, Colo., assignors to Rollei of America, Inc., Littleton, Colo.

Filed Mar. 11, 1976, Ser. No. 665,839
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **33 Claims**



1. In an electronic flash system including electronic flash apparatus, contact means operable by a user, and light sensing means positioned remotely with respect to the electronic flash apparatus, the invention comprising:
flash producing means;
first and second terminals adapted to be connected to the light sensing means, and having the contact means connected therebetween;
switching means having first and second main current carrying electrodes and a control electrode, the switching means causing actuation of the flash producing means when the switching means switches from a non-conductive to a conductive state;
first potential establishing means connected between the first main current carrying electrode and the first terminal for establishing a potential therebetween;
second potential establishing means connected between the first and second terminals for establishing a potential between the first and second terminals prior to closure of the contact means; and

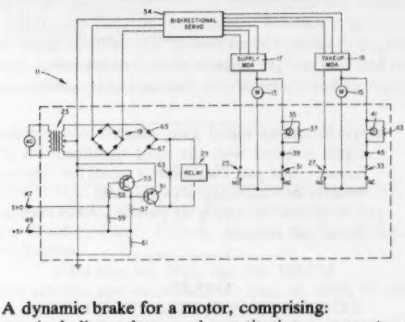
first capacitor means for producing, in response to closure of the contact means, a signal to the control electrode of the switching means to cause the switching means to switch from a non-conductive to a conductive state.

4,085,354

TAPE TRANSPORT DYNAMIC BRAKE

Robert P. Harshberger, Jr., San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 3, 1976, Ser. No. 682,377
Int. Cl.[2] H02P 3/14
U.S. Cl. 318—87 **6 Claims**



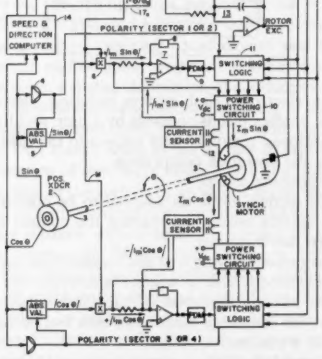
1. A dynamic brake for a motor, comprising:
means including a lamp and constituting a generator load that varies substantially inversely exponentially with generator velocity; and
means operable upon power stoppage to said motor for coupling said motor as a generator to operate said load.

4,085,355

VARIABLE-SPEED REGENERATIVE BRUSHLESS ELECTRIC MOTOR AND CONTROLLER SYSTEM

Richard B. Fradella, 33872 Calle Conejo, San Juan Capistrano, Calif. 92675

Filed Apr. 26, 1976, Ser. No. 680,388
Int. Cl.[2] H02P 3/18
U.S. Cl. 318—168 **12 Claims**



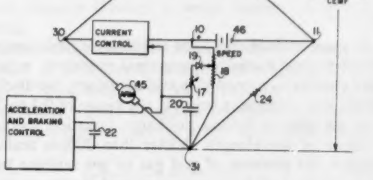
1. A system for providing controlled variable-speed motor and generator action; including in combination
a synchronous polyphase machine comprising a stator with a plurality of windings and a cooperating rotor that dictates the angle of a magnetic field which rotates therewith;
transducer means for providing polyphase rotor position signals, each varying sinusoidally in accordance with rotor position, with respective phases corresponding to the stator windings;
means for deriving from each said rotor position signal analog and binary signals representing the instantaneous absolute value and polarity thereof;
means for providing an amplitude control signal and binary drive and brake commands;
a plurality of single-quadrant multiplier means, each responsive to a corresponding absolute value signal and to said amplitude control signal, for providing synchronized amplitude control signals;
a plurality of servo loop means for controlling current of each stator winding in compliance with the corresponding synchronized amplitude control signal, the corresponding binary polarity signal, and said binary drive and brake commands.

4,085,356

SPEED CONTROL SYSTEM FOR MODEL RAILROADS

Herbert E. Meinema, 2231 Holly Ave., Escondido, Calif. 92027

Filed Dec. 8, 1975, Ser. No. 638,503
Int. Cl.[2] H02P 1/04
U.S. Cl. 318—331 **2 Claims**



1. A current supply for model railroads having a driving motor connected for receiving current therefrom which comprises a continuous DC speed control circuit controlling the armature current as a function of the counter electromotive force developed by rotation of the driving motor armature thereby to regulate the armature rotational speed, comparison means in which said counter electromotive force is compared to a speed control reference voltage of predetermined magnitude derived by a voltage divider across a DC supply, means controlling the current supplied to the motor armature with the resultant differential voltage, storage capacitor means for retaining a charge proportional to the reference voltage and switching means selectively controlling the charge and discharge of said capacitor means to simulate braking and acceleration.

4,085,357

SYNCHRONOUS SWITCHING MEANS FOR OPERATING CABLE MARKING APPARATUS

Chris Ansberg, Vaihingen, and Klaus Maisel, Aurich, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,215
Claims priority, application Germany, Feb. 18, 1975, 2506762
Int. Cl.[2] G05B 11/18
U.S. Cl. 318—590 **4 Claims**

1. In an apparatus for marking a running length indication on the outer plastic jacket of an electric cable at a location immediately behind a screw extruder which provides the cable core with an outer jacket, cable length measuring means located at a distance from and electrically coupled to said marking apparatus controlled by the running length of said cable including at least two selectively connectable, spaced apart length mea-

suring devices positioned along the cable, each of which is connected to the marking apparatus by switching means in-

cluding circuitry for automatically determining the most favorable switching instant and for performing said preselected switching operation to control said marking apparatus.

4,085,358

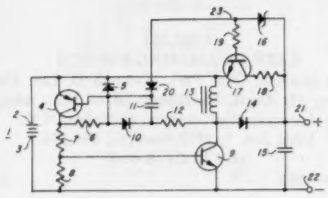
REGULATED DC TO DC POWER SUPPLY WITH AUTOMATIC RECHARGING CAPABILITY

Stanley W. Holcomb, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 641,786

Int. Cl.[2] H02J *7/00*

U.S. Cl. 320—9 **45 Claims**



1. An electrical circuit comprising: an input, an output, voltage responsive means connected to said input and normally responsive to the application of a first electrical potential thereto to change successively between first and second electrical conditions thereby to develop a second electrical potential at said output, said second electrical potential being a higher potential than said first electrical potential and control means, interconnecting said voltage responsive means and said output, for interrupting said successive change when the potential at said output rises to a first predetermined level and for conducting current from said output to said input when the potential at said output is at a second predetermined level higher than said first predetermined level.

4,085,359

SELF-STARTING AMPLIFIER CIRCUIT

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 12, 1976, Ser. No. 713,821

Claims priority, application United Kingdom, Feb. 3, 1976, 04209/76

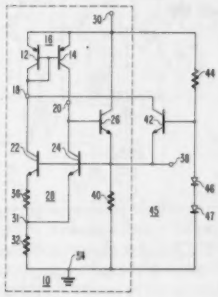
Int. Cl.[2] G05F *1/56*

U.S. Cl. 323—22 T **4 Claims**

1. In a circuit comprising first and second terminals for application of an operating potential therebetween; first and second current amplifiers, each amplifier having an input and an output current path and a common node, said first current amplifier input and output current paths connected to said second current amplifier output and input paths respectively forming a positive feedback loop thereby, said first current amplifier common node connected to said first terminal, said second current amplifier common node connected to said second terminal, means for degenerating the open loop gain of said positive feedback loop to unity when the levels of current in said loop exceed equilibrium values and a resistance in series connection with the input current path of said second current amplifier between the output current path of said first current amplifier and said second terminal, wherein said circuit has the undesirable tendency to fail to initiate conduction within said loop upon application of said operating voltage thereto, a starting circuit for overcoming said undesirable tendency, comprising,

a transistor having an emitter electrode connected to the end of said series connection remote from said second terminal, having a collector electrode connected for conditioning the transistor for normal transistor operation, and having a base electrode;

means responsive to said operating voltage being applied for



applying a substantially constant direct potential between said second terminal and the base electrode of said transistor of a value such that said transistor is conductive to supply its emitter current to the input current path of said second current amplifier as a starting current, until conduction levels within said loop reach predetermined values smaller than said equilibrium values, whereupon the potential drop across said resistance increases the potential across said series connection to reverse-bias the base-emitter junction of said transistor and terminate the application of said emitter current.

4,085,360

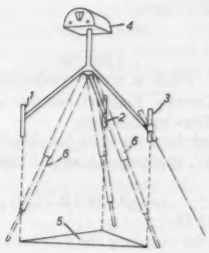
METHOD AND APPARATUS FOR DETERMINING THE PRESENCE OF OR ABSENCE OF AN UNDERGROUND BODY

Mark Ian Howell, 108 Sylvan Way, Sea Mills, England

Filed Jun. 14, 1976, Ser. No. 695,568

Int. Cl.[2] G01V *3/10*; G01R *33/02*

U.S. Cl. 324—3 **13 Claims**



1. An instrument for determining the presence or absence of an underground body capable of radiating an electromagnetic field, such as a buried pipe or cable, comprising an array of at least three generally similarly oriented receiver antenna coils, means for mounting such coils so that their extended axes define the corners of a polygonal area on the ground, a receiver including means coupled to said coils for comparing the phases of signals produced in all the coils, and means coupled to said comparing means for giving a warning signal only when any two of the first-mentioned signals are in antiphase

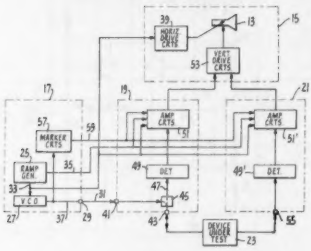
thereby to indicate that at least one pair of said extended axes are straddling an underground body.

4,085,361

MEASUREMENT OF FREQUENCY RESPONSE WITH IMPROVED SENSITIVITY AND ACCURACY

Robert H. Bathiany, San Jose, and Bernhard Jensen, Mountain View, both of Calif., assignors to Wiltron Company, Mountain View, Calif.

Filed Mar. 10, 1977, Ser. No. 776,233
Int. Cl.[2] G01R *27/00*
U.S. Cl. 324—57 SS **41 Claims**



1. A system for measuring the level of a desired signal over a frequency range of interest that appears in a circuit under test of a given impedance along with undesirable interferring noise within a frequency range exclusive of said signal frequency range, comprising:

an input signal port having first and second sides,

a finite input termination impedance connected between said first and second sides of said input port, whereby voltages corresponding to said desired signal and said undesirable interferring noise are developed across said impedance,

a first reactance element connected to said first side of said port, and a second reactance element connected to said second side of said port, each reactance element characterized by having a lower impedance to said signal frequency range of interest than to said interferring noise, and

means operably connected to said first and second input port sides in series with said reactance elements for indicating the value of said signal of interest across said input impedance, whereby the reactance elements isolate said indicating means from any interferring noise voltage across said input impedance.

4,085,362

CHECK SYNCHRONISM

Robert Evans, Crawley, England, assignor to Stone-Platt Crawley Limited, Crawley, England

Filed Aug. 19, 1976, Ser. No. 715,949
Claims priority, application United Kingdom, May 10, 1976, 19173/76
Int. Cl.[2] G01R *25/00*
U.S. Cl. 324—83 D **6 Claims**

1. Apparatus for checking the synchronism of two alternating voltages comprising,

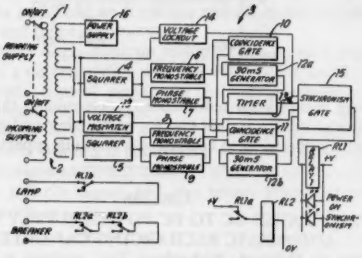
means for generating a first pair of trains of square wave pulses corresponding to the zero crossing points of respectively said two alternating voltages with each pulse having a first width,

means for generating a second pair of trains of square wave pulses also corresponding to the zero crossing points of respectively said two alternating voltages with each pulse having a second width less than that of said first width by a predetermined amount,

first coincidence means for sensing overlap between the pulses of said first pair of trains of pulses,

second coincidence means for sensing overlap between the pulses of said second pair of trains of pulses,

and output means providing an output indication of said two alternating voltages having obtained coincidence of frequency and phase within preselected allowable limits only if said second coincidence means senses coincidence at least a predetermined time after said first coincidence means senses coincidence.

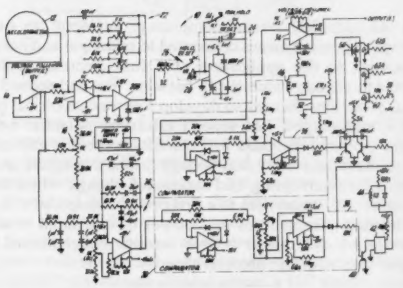


4,085,363

RATE MEASURING SYSTEM

Anthony N. Gravina, Deer Park; Kenneth D. Lev, Commack, and Arthur H. Angst, Northport, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 9, 1976, Ser. No. 694,184
Int. Cl.[2] G21B *3/42*
U.S. Cl. 324—162 **2 Claims**



1. A rate measuring system, comprising:

(a) at least one accelerometer for providing an output voltage proportional to an acceleration input;

(b) amplifying means connected to the output of said accelerometer for amplifying said voltage proportional to acceleration, said amplifying means having an adjustable voltage gain for changing the scale of the output voltage from said accelerometer to provide full scale, multi-range operation over the entire range of acceleration inputs;

(c) an integrator;

(d) first comparator means connected to the output of said accelerometer for producing an output when the voltage from a accelerometer exceeds said predetermined value;

(e) first switch means responsive to the output from said first comparator means for connecting the output of said amplifying means to the input of said integrator when said accelerometer voltage exceeds said predetermined value;

(f) second comparator means connected to the output of said integrator for producing an output when the voltage from said integrator exceeds a predetermined value; and

(g) second switch means connected across said integrator and responsive to the outputs from said first and second comparator means for bypassing said integrator to provide a nominal zero velocity output signal when the inputs

to said first and second comparator means are below predetermined values.

4,085,364

CIRCUIT FOR SETTING TRANSMISSION AND RECEPTION FREQUENCIES

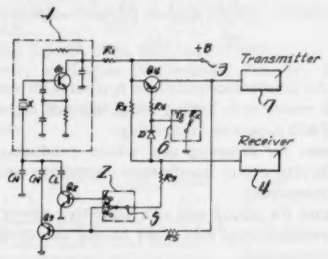
Takao Kakigi, Kawasaki, Japan, assignor to Cybernet Electronic Corporation, Kawasaki, Japan

Filed Aug. 24, 1976, Ser. No. 717,460

Claims priority, application Japan, Aug. 28, 1975, 50-118271[U]; Aug. 28, 1975, 50-118272[U]; Aug. 28, 1975, 50-118273[U]

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—20 **1 Claim**



1. A circuit for setting transmission and reception frequencies comprising:

a transistor having an emitter, a collector and a base;

means for connecting the emitter of the transistor to a first polarity terminal of an external power supply;

change-over switch means for connecting and disconnecting the base of the transistor to and from a second polarity terminal of the external power supply to alternately bias the transistor conductive and non-conductive;

a transmitting circuit connected to the collector of the transistor, the transistor providing a path for current between the first polarity terminal of the external power supply and the transmitting circuit when the transistor is conductive;

a receiving circuit;

a diode having one end connected to the base of the transistor and the other end connected to the receiving circuit;

a resistor connected between the emitter of the transistor and the other end of the diode, the resistor providing a path for current between the first polarity terminal of the external power supply and the receiving circuit when the transistor is non-conductive;

an oscillator including a quartz crystal resonator;

means for connecting the oscillator to the first polarity terminal of the external power supply;

a plurality of capacitors connected to the quartz crystal resonator including a first capacitor for setting a center frequency of the oscillator;

means responsive to the biasing of the transistor conductive for delivering current from the first capacitor to the second polarity terminal of the external power supply to set the oscillation frequency of the oscillator at the center frequency; and

means responsive to the biasing of the transistor non-conductive for delivering current from predetermined ones of the plurality of capacitors to the second polarity terminal of the external power supply to shift the frequency of the oscillator in a range about the center frequency.

4,085,365

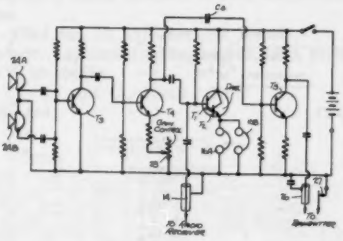
EARPHONE ADAPTER FOR AIRCRAFT RADIOS

Franklin G. Reick, Westwood, N.J., assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Filed Sep. 24, 1975, Ser. No. 616,361

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—21 **5 Claims**



1. An adapter making it possible to couple two sets of earphones to the relatively low-impedance output of an aircraft navigation-communication system without adversely affecting the operation of a loudspeaker already coupled to the same low impedance output, so that a wearer of the set can listen without difficulty to the system despite ambient noise that may impair the understandability of intelligence emitted by the loudspeaker, said adaptor comprising:

A. a battery-operated transistorized audio amplifier whose input circuit has an extremely high impedance and whose output circuit has a relatively low impedance, said amplifier having first and second transistors in a Darlington configuration in which the emitter of the first transistor is connected to the base of the second transistor, said amplifier having a high gain and including a volume control;

B. means including a d-c blocking capacitor for connecting the high-impedance input circuit of said amplifier to the low-impedance output circuit of said system to create a gross mismatch in impedance therebetween whereby virtually no load is imposed on the system, the resultant low level input signal fed to said amplifier by reason of said mismatch being compensated for by said high gain;

C. means connecting two sets of earphones to the output circuit of said amplifier; and

D. a buffer amplifier whose input is coupled to two microphones, one serving a first wearer of one set of said earphones and the other a second wearer of the other set of earphones, the output of the buffer amplifier being connected to the input circuit of the transistorized audio amplifier through a high impedance, whereby the adapter also functions as an intercom between said wearers without imposing a significant load on said system.

4,085,366

NOISE REDUCTION DEVICE FOR CITIZEN'S BAND TRANSCEIVERS

Billy Padgett, 606 S. Ohio St., Sedalia, Mo. 65301

Filed Sep. 29, 1976, Ser. No. 727,955

Int. Cl.[2] H04B *1/40*

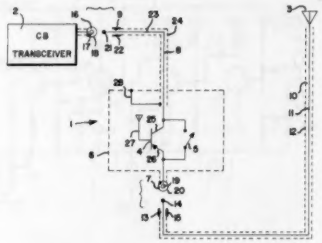
U.S. Cl. 325—22 **8 Claims**

1. A noise reduction device in combination with a transceiver and an antenna therefor, said transceiver having a transmission mode and a reception mode and including a lead conductor and a shield conductor, said antenna including an antenna cable having a lead and shield thereof normally connected to said transceiver lead conductor and shield conductor respectively, said noise reduction device comprising:

(a) a solid state means having a first, a second, and a third terminal, each terminal including a lead connected thereto, said first and second terminals normally having a high impedance therebetween and having a low impe-

dance therebetween in response to a suitable bias signal applied to said third terminal;

(b) said solid state means being interposed between said transceiver and said antenna for reducing the signal strength to said transceiver during the reception mode by means of said normal high impedance between said first and second terminals, said first terminal being connected to said antenna cable lead and said second terminal being



connected to said transceiver lead conductor, and said antenna cable shield being connected to said transceiver shield conductor; and

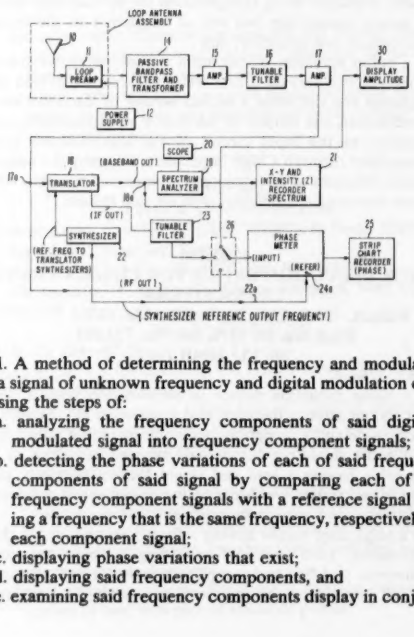
(c) a bias antenna connected to said third terminal and operative upon reception of radio frequency energy emitted by said transceiver during said transmission mode to apply said energy as a suitable bias signal to said third terminal thereby effecting said low impedance between said first and second terminals.

4,085,367

METHOD AND DETECTION OF PHASE AND FREQUENCY MODULATION

John Chamberlin Williams, Moorestown, and William Braxton Sisco, Voorhees, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,413
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—67 **7 Claims**



1. A method of determining the frequency and modulation of a signal of unknown frequency and digital modulation comprising the steps of:

a. analyzing the frequency components of said digitally modulated signal into frequency component signals;

b. detecting the phase variations of each of said frequency components of said signal by comparing each of said frequency component signals with a reference signal having a frequency that is the same frequency, respectively, of each component signal;

c. displaying phase variations that exist;

d. displaying said frequency components, and

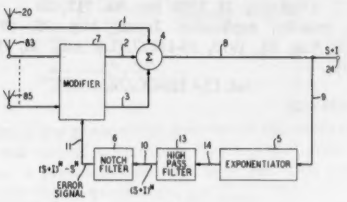
e. examining said frequency components display in conjunction with said phase display to determine the modulation of said unknown frequency signal.

4,085,368

INTERFERENCE CANCELING METHOD AND APPARATUS

Yu Shuan Yeh, Freehold Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 30, 1976, Ser. No. 718,555
Int. Cl.[2] H04B *7/08*
U.S. Cl. 325—304 **11 Claims**



1. An interference reduction apparatus for use with a plurality of waves each having components of signal and interference, said apparatus comprising:

means for summing said waves, producing a sum wave having a sum interference component and a sum signal component;

means for raising said sum wave to a power, producing an exponentiated sum wave having an exponentiated signal component;

means for substantially removing said exponentiated signal component from said exponentiated sum wave, producing a first error signal; and

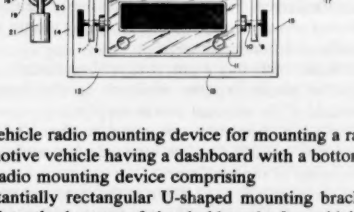
means responsive to said first error signal for modifying at least one of said waves before summing, whereby said first error signal and said sum interference component are reduced.

4,085,369

VEHICLE RADIO MOUNTING DEVICE

Harry W. Burke, Wright, Minn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 18, 1976, Ser. No. 742,797
Int. Cl.[2] A47B *96/06;* **E05B** *73/00*
U.S. Cl. 325—312 **2 Claims**



1. A vehicle radio mounting device for mounting a radio in an automotive vehicle having a dashboard with a bottom, said vehicle radio mounting device comprising

a substantially rectangular U-shaped mounting bracket affixed to the bottom of the dashboard of a vehicle, said mounting bracket having a head affixed to the dashboard and a pair of spaced parallel arms extending perpendicularly from the head, said arms having bores formed therethrough;

pin means extending through the bores of the arms of the mounting bracket and swivelly mounting a radio in said mounting bracket;

a substantially rectangular U-shaped securing bracket hav-

ing a head, a pair of spaced parallel arms extending perpendicularly from the head of the securing bracket and a pair of flange parts each extending away from the other from a corresponding one of the arms of the securing bracket at the free edges thereof substantially parallel to the head of the securing bracket;

hinge means hingedly affixing the securing bracket to the bottom of the dashboard at one of the flange parts with the arms of the securing bracket parallel to and closely spaced from the arms of the mounting bracket whereby the pin means are prevented from withdrawal by the arms of the securing bracket; and

locking means for locking the other of the flange parts of the securing bracket to the bottom of the dashboard to prevent unauthorized movement of the securing bracket.

4,085,370
RADIO RECEIVER HAVING CO-CHANNEL INTERFERENCE OPERATED SQUELCH

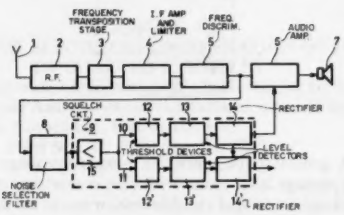
Johannes van der Poel, and Johannes Noordanus, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,900

Claims priority, application Netherlands, Feb. 10, 1975, 7511580

Int. Cl.² H04B 1/10

U.S. Cl. 325—348 **7 Claims**



1. A radio receiver for carrier signals frequency-modulated with signals within a speech frequency band, comprising an input means for receiving said carrier signals, a frequency-transposition stage coupled to said means, a tuned intermediate frequency amplifier and limiting circuit coupled to said transposition stage and having a given passband characteristic, a frequency discriminator coupled to said intermediate frequency amplifier and limiting circuit, a switchable audio amplifier coupled to said discriminator and having a control input means, a noise selection band pass filter coupled to said discriminator having a sharp pass band characteristic with upper and lower frequency limits both of which lie between the upper limit of the speech frequency band and a frequency numerically equal to half the frequency difference between the limits of the pass band characteristic of the intermediate frequency amplifier and limiting circuit, first and second voltage threshold responsive device means coupled to said filter for responding when first and second voltage thresholds respectively are exceeded at the inputs thereof, both of said thresholds lying above the noise which will be inherently applied in operation by the noise filter to the inputs of said first and second threshold responsive device means when the receiver is limiting and co-channel interference is absent, and below the noise which will be inherently applied in operation by the noise filter to the inputs of said first and second threshold responsive device means when the receiver is well out of limiting, the second threshold being higher than the first and the output of the second voltage threshold responsive device being coupled to said control input means of the audio amplifier for blocking transmission through said audio amplifier when the second threshold is exceeded at the input of said second threshold responsive device said first threshold device responsive means having output means for providing an early warning signal of co-channel interference.

4,085,371
AUTOMATICALLY TUNED MEMORY TELEVISION CHANNEL SELECTING APPARATUS

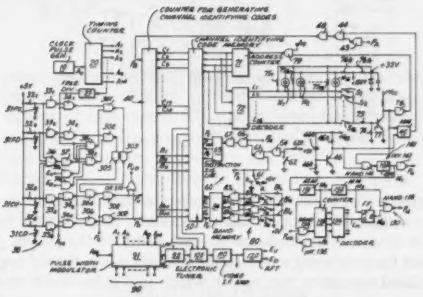
Takao Mogi, Tokyo; Koji Morita, Kodaira, and Hisao Okada, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,655

Claims priority, application Japan, Aug. 28, 1975, 50-104445; Aug. 29, 1975, 50-104556

Int. Cl.² H04B 1/06

U.S. Cl. 325—464 **12 Claims**



1. A channel selecting apparatus for a television receiver having an electronic tuning tuner for changing the receiving frequency in accordance with an analog control signal applied thereto; said channel selecting apparatus comprising memory means having a plurality of addresses for storing respective digital codes each identifying a respective channel, addressing means actuable for selectively activating each of said addresses in the memory means so as to effect read out of the respective channel identifying digital code, digital-to-analog converting means for converting the digital code being read out of said memory means into a respective analog control signal for said tuner, automatic fine tuning means which includes means for detecting deviation of the receiving frequency, as established in response to said analog control signal, from the correct receiving frequency for the channel identified by the digital code then being read out of said memory means, and means responsive to a detected deviation of said established receiving frequency from said correct receiving frequency for modifying the channel identifying digital code being converted by said converting means in the sense for removing said deviation, and means operative, when said deviation exceeds a predetermined amount, to store the resulting modified digital code in said memory means in place of the read out digital code resulting in said deviation.

4,085,372
CHANNEL SELECTING APPARATUS FOR A TELEVISION RECEIVER WITH AN ELECTRONIC TUNER

Takao Mogi, Tokyo, and Hisao Okada, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,702

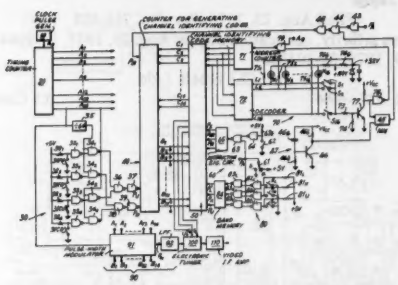
Claims priority, application Japan, Aug. 27, 1975, 50-103668

Int. Cl.² H04B 1/06

U.S. Cl. 325—464 **9 Claims**

1. A channel selecting apparatus for a television receiver having a tuner with a voltage-controlled, variable reactance device as its tuning element; said channel selecting apparatus comprising memory means having a plurality of addresses for storing respective digital codes identifying respective channels, means for effecting the read out of a selected one of said digital codes from the respective address of said memory

means, digital-to-analog converting means operative to convert the digital code being read out of said memory means to a respective analog voltage for controlling said variable reactance device, said digital-to-analog converting means including pulse-width modulator means operative to produce a chain of pulses at a predetermined repetition rate with the width of each of said pulses being dependent on said selected digital code read out of said memory means, and low-pass filter means



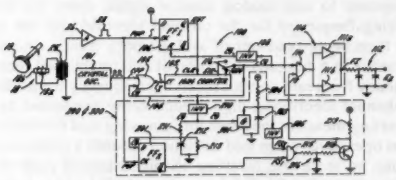
receiving said chain of pulses from said modulator means for providing said analog voltage to control said variable reactance device in dependence on said width of the pulses, and means for producing a circulating digital code with said predetermined repetition rate; and in which said pulse-width modulator means also receives said circulating digital code and determines said pulse width in dependence on the absence of coincidence between said selected digital code read out of said memory means and said circulating digital code.

4,085,373

FREQUENCY-TO-VOLTAGE TRANSDUCER FOR SPEED GOVERNOR SYSTEMS OR THE LIKE

Robert G. McConnell, Fort Collins, Colo., assignor to Woodward Governor Company, Rockford, Ill.

Filed Nov. 3, 1976, Ser. No. 738,354
Int. Cl.[2] H03K *9/06*
U.S. Cl. 328—141 **10 Claims**



1. In a transducer for converting the variable frequency of recurring input signals into a correspondingly varying dc. output, the combination comprising

(a) an oscillator producing rapidly repeating signals at a constant, predetermined frequency substantially greater than the maximum frequency of said input signals,

(b) a digital counter having an output terminal on which appears a counter output voltage at a first or second level when the counter respectively is in or is not or above a predetermined count state, one of said levels being relatively high and the other relatively low,

(c) gate means interposed between said oscillator and the counting input of said counter,

(d) means responsive to said voltage on said counter output terminal for controlling said gate means to be disabled or enabled when the counter is or is not in said predetermined count state,

(e) means responsive to each of said input signals for resetting said counter to a preselected count state lower than said predetermined count state, and

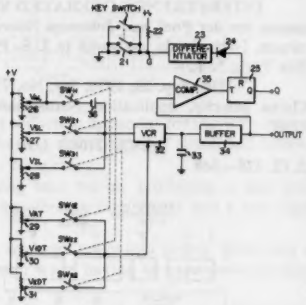
(f) means for filtering said counter output voltage to create a final dc. output which varies as the average of such voltage and inversely in proportion to the frequency of said input signals.

4,085,374

GENERATOR FOR GENERATING CONTROL VOLTAGE WAVEFORM

Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Jan. 3, 1977, Ser. No. 756,351
Claims priority, application Japan, Jan. 12, 1976, 51-2593; Mar. 5, 1976, 51-26133[U]
Int. Cl.[2] G10H *5/10;* **H03K** *17/60*
U.S. Cl. 328—143 **12 Claims**



1. A generator for generating a control voltage waveform whose voltage level varies with time comprising:

a voltage-controlled variable resistor means having a control input, an input and an output, the resistance between the input and output of said variable resistor depending on the voltage level at the control input;

a storage means coupled with the output of said voltage-controlled variable resistor means for forming a time constant circuit with said variable resistor means and providing said control voltage waveform;

first sources of voltage signals;

second sources of time constant determing voltage signals;

first coupling means for sequentially coupling said first sources to the input of said voltage-controlled variable resistor means; and

second coupling means for sequentially coupling said second sources to the control input of said voltage-controlled variable resistor means in synchronism with said first coupling means.

4,085,375

COMBINED ANGULAR DISPLACEMENT MEASURING SYSTEM AND MULTIPLIER

George Galuschak, Hasbrouck Heights, and Saul Leon Malkiel, Englewood, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 18, 1976, Ser. No. 742,764
Int. Cl.[2] G01C *9/06*
U.S. Cl. 328—160 **4 Claims**

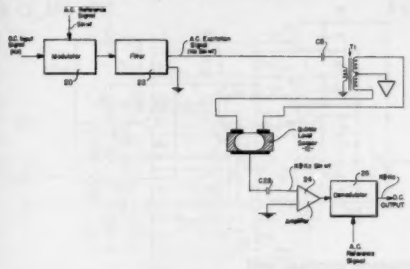
1. A combined angular displacement measuring and multiplier system comprising:

a bubble-type level sensor responsive to an alternating current excitation signal for producing an output having an amplitude proportional to the amplitude of the alternating current excitation signal and to the angular displacement of the sensor from a reference level;

modulator means coupled to said sensor for supplying said alternating current excitation signal thereto;

first input circuit means coupled to said modulator means for supplying an alternating current reference signal thereto;

second input circuit means coupled to said modulator means for supplying a second input signal thereto to be amplitude



modulated on said alternating current reference signal; and

an output circuit coupled to said sensor for deriving an output signal therefrom having an amplitude representative of the product of the angular displacement of the sensor from the reference level and the amplitude of said second input signal.

4,085,376

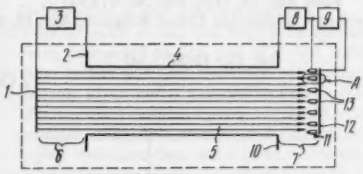
DEVICE FOR ELECTRICAL DECELERATION OF FLOW OF CHARGED PARTICLES

Evgeny Aramovich Abramyan, ulitsa Chaikovskogo, 13, kv. 91, Moscow, and Anatoly Nikolaevich Sharapa, ulitsa Uchenykh, 8, kv. 103, Novosibirsk, both of U.S.S.R.

Filed Sep. 27, 1976, Ser. No. 726,809

Int. Cl.[2] H05H *1/00*; H01J *1/02*

U.S. Cl. 328—233 **9 Claims**



1. A device for electrical deceleration of a flow of accelerated charged particles comprising: a first electrode positioned across the flow and having a potential equal to the energy of the flow being decelerated; a second electrode positioned behind said first electrode downstream of the flow and having a potential approximately equal to zero, said second electrode being made as a plurality of pointed members with their points directed toward said flow of charged particles; a third electrode for reception of said particles positioned behind said second electrode downstream of said flow and having a small potential of the same sign as that of said first electrode.

4,085,377

MICROWAVE FREQUENCY DISCRIMINATOR COMPRISING A ONE PORT ACTIVE DEVICE

Zygmond Turski, Selden, N.Y., and Arye Rosen, Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,829

Int. Cl.[2] H03D *3/26*

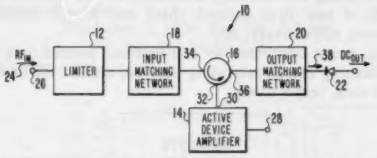
U.S. Cl. 329—116 **8 Claims**

1. A microwave frequency discriminator comprising:

a one port active device amplifier including an active device, said active device being biased an amount for generating an output RF signal within a predetermined frequency bandwidth in response to an input RF signal of substantially constant power level;

means for coupling said input RF signal into said amplifier, and for coupling said ouput RF signal out from said amplifier;

input and output impedance matching means connected to said coupling means, said input and output matching



means being formed to provide selected input and output impedance conditions to said amplifier such that the power of said output RF signal varies substantially linearly with the frequency of said input RF signal throughout said frequency bandwidth; and

detector means responsive to said output RF signal for generating a D.C. signal varying substantially linearly as a function of the frequency of said input RF signal.

4,085,378

QPSK DEMODULATOR

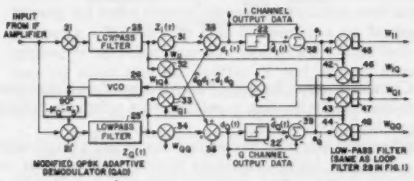
Carl R. Ryan, Hancock, Minn., and James H. Stilwell, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 586,108, Jun. 11, 1975, abandoned.

This application Nov. 26, 1976, Ser. No. 745,143

Int. Cl.[2] H03D *3/02*

U.S. Cl. 329—124 **2 Claims**



1. In a QPSK demodulator wherein two modulated incoming quadrature separated signals are received at an input and demodulated into first and second signals, the improvement including:

first, second third and fourth variable amplifying means each having input, output and control terminals;

first and second summing means each having two inputs and an output;

the input terminals of said first and third amplifying means being connected to receive the first signal and the input terminals of said second and fourth amplifying means being connected to receive the second signal;

the inputs of said first summing means being connected to the output terminals of said first and fourth amplifying means, respectively, and the inputs of said second summing means being connected to the output terminals of said second and third amplifying means, respectively;

first and second data error estimating means connected to the output terminals of said first and second summing means, respectively;

first, second, third and fourth correlating means each having two inputs and an output;

one input of said first correlating means being connected to the first data error estimating means and the other input being connected to receive the first signal, one input of said second correlating means being connected to the

second data error estimating means and the other input being connected to receive the second signal, one input of said third correlating means being connected to the second data error estimating means and the other input being connected to receive the first signal, and one input of said fourth correlating means being connected to the first data error estimating means and the other input being connected to receive the second signal;

the output terminals of said first, second, third and fourth correlating means being connected to the control terminals of said first, second, third and fourth amplifying means, respectively; and

output means connected to said first and second data error estimating means providing first and second channel output data, respectively.

4,085,379

AMPLIFIER FOR FLOATING VOLTAGE SOURCE

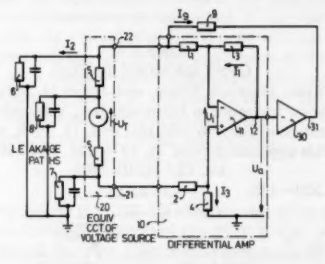
Hans Kubach, Munchigen, and Peter Zieher, Markgroningen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 9, 1977, Ser. No. 776,084

Claims priority, application Germany, Mar. 10, 1976, 2609841

Int. Cl.² H03F *3/45, 1/34*

U.S. Cl. 330—69 **7 Claims**



1. Circuit for amplification of the voltage of a voltage source that is electrically floating in relation to a reference potential, comprising, in combination:

a differential amplifier having two inputs and a single output, said inputs being connected through series input resistances to the voltage to be amplified as provided by said voltage source and said output making available an amplification of the voltage of said source as a voltage between the output and said reference potential, and

means for shifting the potential of said source (20) in the direction towards said reference potential exclusively by positive feedback around said differential amplifier that draws a current (I_9) through one of said series input resistances, which current is proportional to said voltage between said differential amplifier output and said reference potential.

4,085,380

BIQUAD RC ACTIVE FILTER

Jerry G. Williford, Tustin, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 26, 1976, Ser. No. 745,031

Int. Cl.² H03F *1/36*

U.S. Cl. 330—107 **12 Claims**

1. A biquad RC active filter, comprising:

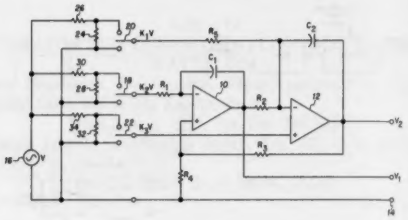
a pair of operational amplifiers, each having an inverting and non-inverting input;

a pair of capacitors, each being connected between the output and inverting input of a different one of said amplifiers;

a first resistor connected to the inverting input of a first one of said amplifiers;

a second resistor interconnecting the output of said first amplifier with the inverting input of the second one of said amplifiers;

feedback circuit means interconnecting the output of said second amplifier with the non-inverting input of said first amplifier;



a common terminal, and

input circuit means for applying a signal referenced to said common terminal to at least one of the inputs of said amplifiers with the exception of the non-inverting input of said first amplifier.

4,085,381

AMPLIFIERS

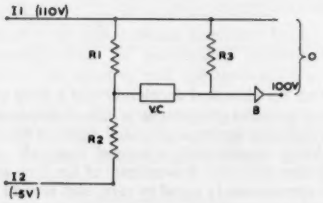
John Didwith Lewis, Braintree, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 19, 1976, Ser. No. 678,427

Claims priority, application United Kingdom, Apr. 18, 1975, 16082/75

Int. Cl.² H03F *3/00*

U.S. Cl. 330—147 **2 Claims**

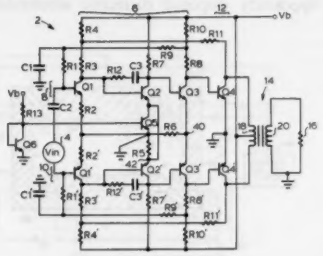


1. An amplifier for amplifying and inverting a low voltage wave form comprising independently fed first and second resistors connected to a common output which feeds a third resistor via a voltage to current converter, the other end of the third resistor being driven from the same point as the first resistor, the ratio of the resistances of the first and second resistors being made equal to the amplification required so that when the low voltage wave form is fed to the second resistor and a wave form approximating to the required output and of slightly higher voltage is fed to the first and third resistors, the voltage at the common output is proportional to the voltage difference between the wave form approximating to the required output and the voltage thereby developed across the third resistor by the voltage current converter is approximately equal to the error.

4,085,382
CLASS B AMPLIFIER

Herbert Douglas Barber, Dundas, and Gary Curtis Salter, Burlington, both of Canada, assignors to Linear Technology Inc., Burlington, Canada

Filed Nov. 22, 1976, Ser. No. 743,883
Int. Cl.² H03F 3/26
U.S. Cl. 330—262 **6 Claims**



1. An integrated circuit low level low power direct coupled class B amplifier formed on a substrate and having a terminal adapted to be connected to a battery, said amplifier comprising:

(a) two substantially identical amplifying channels,

(b) each amplifying channel having, separately from the other channel:

(i) a preamplifier channel having three preamplifier gain transistors including a first stage preamplifier transistor a second stage preamplifier transistor and a third stage preamplifier transistor, all of said preamplifier transistors being direct coupled,

(ii) an output transistor direct coupled to said third stage preamplifier transistor,

(iii) a DC negative feedback loop connecting the collector of said third stage preamplifier transistor to the base of said first stage preamplifier transistor to regulate the DC currents in said output transistors,

(iv) the collector of said first stage preamplifier transistor being connected to one end of a first resistance, the other end of said first resistance being connected at a junction to one end of a second resistance, the other end of said second resistance being connected to said battery terminal, said first resistance being of substantially higher resistance than said second resistance,

(v) a substantially purely resistive AC negative feedback loop for reducing the dependence of the gain of each channel on the current through said output transistors, said feedback loop comprising a feedback resistor having a body and a pair of resistor terminals, one of said resistor terminals being connected to the collector of said output transistor and the other of said resistor terminals being coupled to said junction, the resistance of said feedback resistor being substantially higher than that of said second resistance,

(vi) the body of said feedback resistor being insulated from said battery terminal so that the voltage at said feedback resistor may swing above the voltage of said battery,

(vii) compensation means, including a capacitor, connected to the base of one of said preamplifier transistors other than said first preamplifier transistor,

(c) the emitters of at least one pair of said preamplifier transistors being coupled together and through resistance means to ground to provide common mode rejection for said preamplifier,

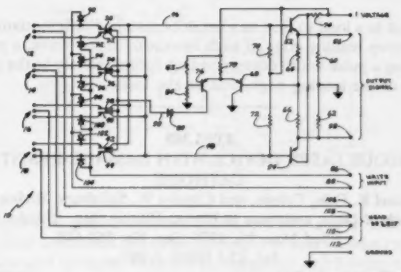
(d) a load for said output transistors, said load having a centre tap and a pair of load end terminals,

(e) said output transistors being of the same polarity and the emitters of said output transistors being coupled together, the collector of one output transistor being connected to one load end terminal and the collector of the other output transistor being connected to the other load end terminal.

4,085,383
MATRIX SELECTION AMPLIFIER CIRCUIT FOR LOW IMPEDANCE HEADS IN A MAGNETIC DISC MEMORY DEVICE

William A. Palm, Minnetonka, and Duane A. Young, Bloomington, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 7, 1976, Ser. No. 730,501
Int. Cl.² H03F 3/45
U.S. Cl. 330—295 **3 Claims**



1. A matrix amplifier circuit adapted to be associated with a plurality of source devices and for receiving and amplifying the signals from only a selected source device comprising:

a plurality of terminations for source devices, each termination comprising at least a first and second electrical connecting point,

a plurality of common base input transistor amplifiers, each amplifier consisting of at least a first and second transistor having the bases thereof connected together, said amplifiers being connected to said terminations by having the emitter of said first transistor connected to said first connection point and the emitter of said second transistor connected to said second connection point,

a common collector transistor amplifier having the base of one of its input transistors connected in common with all of the collectors of one of the transistors of each of said pairs of common base transistor amplifiers and the base of its other input transistor connected in common with all of the collectors of the other transistor of said pairs of common base transistor amplifiers,

means for selecting an input transistor amplifier associated with a selected source device including means for biasing unselected transistors to a cutoff condition, and

means for providing common mode rejection feedback signals to the bases of said common base input transistor amplifiers, said means being connected with said common collector transistor amplifier and to a common connection with the bases of all transistors in all input transistor amplifiers and further providing a source of base current for all of said common base transistor amplifiers.

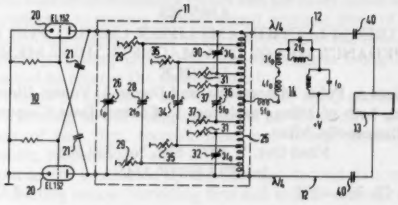
4,085,384
CIRCUIT FOR PRODUCING PULSES BY DIFFERENTIATING OUTPUT OF SAWTOOTH OSCILLATOR

Rudolf G. Zinsser, Idar-Oberstein, Germany, assignor to Reuter Technologie GmbH, Am Rauhen Berge, Germany

Filed Apr. 21, 1977, Ser. No. 789,579
Int. Cl.² H03B 5/10; H03K 5/01, 6/06
U.S. Cl. 331—74 **10 Claims**

1. A pulse generator comprising, in combination, an oscillator including a resonance circuit having multiple frequencies and tuned to the fundamental frequency corresponding the the pulse repetition rate and to at least the first and second harmon-

ics of the fundamental frequency to generate, on its output side, a sawtooth wave with a steep leading edge having an inflexion point; and differentiation members coupling said resonance



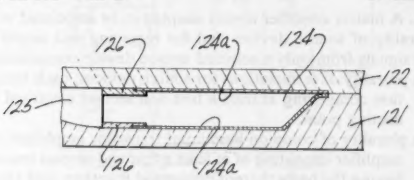
circuit to a load so that, as a result of matched differentiation of the steep leading edge of each sawtooth of the wave, a pulse, having a pulse width corresponding approximately to the pulse time of the leading edge, acts on the load.

4,085,385

GASEOUS LASER DEVICE WITH DAMAGE-RESISTANT CATHODE

Michael E. Fein, Toledo, and Charles W. Salisbury, Rising Sun, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 21, 1975, Ser. No. 560,645
Int. Cl.² H01S 3/097
U.S. Cl. 331—94.5 D **10 Claims**



1. In a gaseous laser device comprising an envelope, a cathode volume having at least one wall, an electrically conductive, relatively large surface area cathode within said cathode volume, a lasing volume, an anode, and means for igniting a gaseous discharge between the anode and the cathode, and wherein the cathode comprises an electrically conductive material supported by at least one cathode wall and wherein the cathode has at least one edge vulnerable to gas discharge deterioration,

the improvement wherein a protective cover plate is juxtaposed over at least a portion of said vulnerable conductive edge of the cathode to substantially prevent gas discharge erosion of said cathode edge, without diminishing the effective cathode area.

4,085,386

INDEPENDENT INITIATION TECHNIQUE OF GLOW DISCHARGE PRODUCTION IN HIGH-PRESSURE GAS LASER CAVITIES

Owen Farish, Bearsden, Glasgow, Scotland, and Richard L. Hundstad, Wilkinsburg, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 365,390, May 30, 1973, abandoned. This application Mar. 9, 1976, Ser. No. 665,349
Int. Cl.² H01S 3/097
U.S. Cl. 331—94.5 PE **2 Claims**

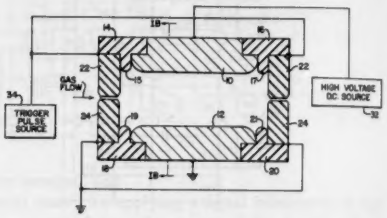
1. A gas laser apparatus comprising:

a resonant optical cavity including optical reflective elements terminating each end of said cavity,

a gas medium at a pressure suitable for lasing action within said resonant optical cavity,

a main electrode assembly means including first and second spaced apart electrode means having surface portions extending in a substantially parallel, opposing relationship, the discharge region of said laser apparatus corresponding to the region between the opposing surface portions of said first and second electrode means, said resonant optical cavity being defined by said optical reflective elements and being essentially coextensive with said discharge region, said first and second spaced apart electrode means being elongated continuous electrodes,

an auxiliary electrode assembly means including dielectric electrode means consisting of a plurality of discrete pairs of oppositely disposed dielectric electrodes extending



between said first and second electrode means and combining with said first and second electrode means to envelope said discharge region,

electrical excitation means connected to said auxiliary electrode assembly means to initiate corona discharge resulting in the injection of free electrons by said auxiliary electrode assembly means into said discharge region, and

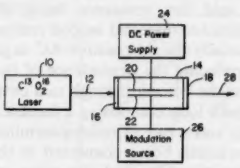
D.C. voltage means connected to said main electrode assembly means to produce a glow discharge in said discharge region in response to said free electrons.

4,085,387

STARK-TUNED LASER MODULATOR

Charles K. Asawa, Pacific Palisades, and Thomas K. Plant, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 18, 1976, Ser. No. 715,461
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 M **9 Claims**



1. A laser modulator comprising in combination:

means including a $C^{13}O_2^{16}$ laser medium for generating a laser beam at a frequency corresponding to a transition selected from the group consisting of the R(18) transition and the R(24) transition of the (00°1–10°0) vibrational band of $C^{13}O_2^{16}$;

a Stark cell disposed in the path of said laser beam and containing $N^{14}H_3$ gas, said gas having an absorption resonance in the vicinity of the frequency of said laser beam;

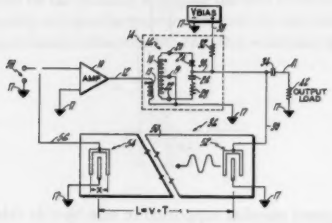
means for generating a dc electric field within said Stark cell of a value to tune said absorption resonance so as to overlap the frequency of said laser beam; and

means for applying a modulating voltage to said Stark cell to vary the instantaneous frequency of said absorption resonance and thereby modulate said laser beam accordingly.

4,085,388
MODE-LOCKED, SURFACE ACOUSTIC WAVE OSCILLATOR

Meyer Gilden, West Hartford; Thomas M. Reeder, Glastonbury, and Anthony J. DeMaria, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 21, 1976, Ser. No. 725,060
Int. Cl.[2] H03B *5/30*
U.S. Cl. 331—107 A **11 Claims**



1. A mode-locked surface acoustic wave oscillator for providing phase coherent, pulsed RF signals having a determined RF carrier frequency, pulse repetition frequency, and pulse width, comprising:

signal shaping means, having a gate input for receiving gate signals and an RF input for receiving input RF signal pulses of a determined RF carrier frequency, for providing, in response to each input RF signal pulse presented simultaneous with the presence of a gate signal at said gate input, and output RF signal pulse having an increased harmonic frequency content and equal carrier frequency;

surface acoustic wave (SAW) delay line means, connected for response to said signal shaping means, for providing a signal propagation time delay to each of said output RF signal pulses from said signal shaping means, said propagation time delay being substantially equal to the reciprocal of the RF signal pulse repetition frequency; and

amplifier means, connected for response to the output of said SAW delay line means, for providing amplification of each RF signal pulse from said delay line means, said amplifier presenting the amplified RF signal pulses to said RF input of said signal shaping means, said amplifier providing in combination with said signal shaping means and said delay line means, a closed loop regenerative RF signal path having a determined frequency bandwidth and a minimum regenerative RF signal path gain equal to the sum of the regenerative RF signal path losses; and

signal synchronizing means, responsive to the RF signal pulses in said regenerative RF signal path, for providing a gate signal in response to each of said RF signal pulses, said gate signals having a pulse repetition frequency equal to that of the RF signal pulses, said signal synchronizing means presenting each of said gate signals to said gate input of said signal shaping means.

4,085,389
AMPLITUDE MODULATION CIRCUIT

Masahiro Kuroda, and Hiromitsu Yoshimura, both of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 764,791
Claims priority, application Japan, Sep. 29, 1976, 51/117017
Int. Cl.[2] H03C *1/40*
U.S. Cl. 332—31 T **7 Claims**

1. An amplitude modulation circuit having a D.C. voltage source and comprising:

a modulated stage adapted to receive a carrier wave;

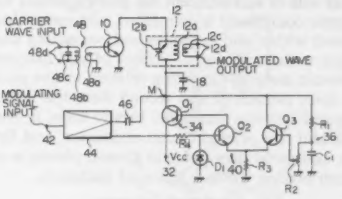
a resonant circuit connected at one end thereof to said modulated stage to provide a modulated carrier wave;

a modulator connected to the other end of said resonant circuit to apply thereto a modulating signal;

a voltage regulator connected between said D.C. voltage source and the other end of said resonant circuit to regulate a D.C. voltage applied to said resonant circuit at a predetermined constant level; and

a coupling capacitor connected between said modulator and the otheer end of said resonant circuit;

said voltage regulator including control means having its input coupled to said D.C. voltage source and its output coupled to the other end of said resonant circuit, an error amplifier to generate a control signal when a potential difference exists between the output of said control means

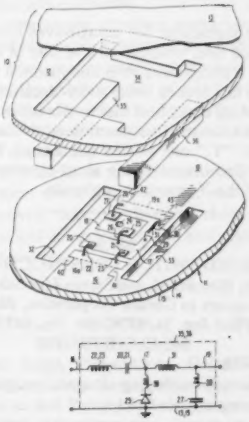


and said predetermined constant level, and a low pass filter connected between the output of said voltage regulator and an input of said error amplifier and having a cut-off frequency selected below a lower limit of a frequency band of the modulating signal, said control means being operative in response to said control signal to zero the potential difference for thereby regulating the D.C. voltage applied to the other end of said resonant circuit to said predetermined constant level when said frequency band is below said cut-off frequency and operative to provide high impedance for the modulating signal when said frequency band exceeds beyond said cut-off frequency of said low pass filter.

4,085,390
SYMMETRICAL STRIPLINE PACKAGE

Arthur Frederick Standing, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Continuation-in-part of Ser. No. 661,596, Feb. 26, 1976, abandoned. This application Sep. 9, 1977, Ser. No. 831,826
Int. Cl.[2] H01P *3/08, 5/08*
U.S. Cl. 333—33 **12 Claims**



1. A microwave package which provides symmetrical ground currents when discrete components are used in a stripline circuit, comprising:

a first printed circuit board formed of a first dielectric material and having a continuous first ground plane on one surface and a printed circuit on the opposite surface;

at least one discrete component electrically coupled to said printed circuit;

a second printed circuit board formed of a second dielectric material and having a continuous second ground plane on one surface a portion of said second dielectric material being cut away to expose said second ground plane; and

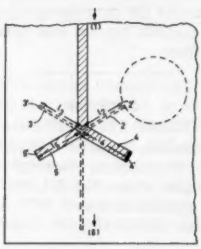
first and second metal blocks each having one cross-sectional dimension equal to the combined thicknesses of said first and second dielectric materials, said first and second dielectric materials having apertures wherein which expose said first and second ground planes, respectively, on either side of and adjacent the printed circuit where said discrete component is connected, said metal blocks being located within said apertures and contacting said ground planes with the exposed surfaces of said first and second dielectric materials in facing relation to one another, said cut away portion of said second dielectric being entirely disposed between said metal bars to form, in conjunction with said first printed circuit conductor, said first dielectric, said metal bars and said ground planes, a microstrip circuit housed within a screened enclosure.

4,085,391

MICRO-STRIP TO A SLOTTED LINE TRANSDUCER

Burkhard Schiek, Halstenbek, Germany, and Frans Christiaan De Ronde, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,163
Claims priority, application Germany, Oct. 18, 1975, 2546836
Int. Cl.[2] H01P *5/08*
U.S. Cl. 333—33 **2 Claims**



1. A planar transducer for microwaves from a micro-strip line to a slotted line, wherein on one side of a dielectric substrate there is a microwave strip line junction in the form of a "Y," one strip line branch being short-circuited, the other strip line branch being open, and that at the other side of the substrate there is a slotted line junction in the form of an oppositely directed "Y," one slotted line branch being open, the other slotted line branch being short-circuited, and wherein the centres of the Y-structures coincide.

4,085,392

REED SWITCH CONSTRUCTION

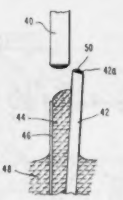
Laimons Lacis, Bloomfield, and Steven Horvath, Irvington, both of N.J., assignors to Gordos Corporation, Bloomfield, N.J.

Filed Jan. 14, 1976, Ser. No. 648,861
Int. Cl.[2] H01H *1/08*
U.S. Cl. 335—58 **3 Claims**

1. A reed switch employing elongated magnetic elements of conductive, magnetic material,

rigid non-magnetic, non-conductive enclosure through which said magnetic elements extend and by which said magnetic elements are supported in predetermined non-aligned position relative to each other, at least one of which magnetic elements is movable, such that in the presence of a magnetic field said magnetic elements will move to a magnetic reluctance minimizing position in which position said magnetic elements are at least in part aligned but not contacting, the space between the unsupported ends of the magnetic elements when aligned being sufficiently small to cause capillary attraction of conductive liquid into said space,

a conductive liquid within said envelope and a reservoir therefor, and



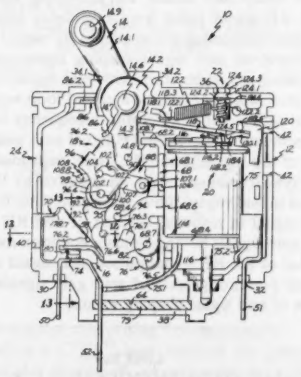
an elongated member supported in side-by-side relationship with said at least one movable magnetic element in position to draw said conductive liquid from the reservoir into a space between said elongated member and said movable magnetic element and positioned to squeeze said conductive liquid toward the end of said magnetic element which the movable magnetic element is moved into alignment with the other magnetic element such that said conductive liquid will be drawn into the space between the ends of the magnetic elements by capillary attractions in said aligned position.

4,085,393

CIRCUIT BREAKER

Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1976, Ser. No. 755,515
Int. Cl.[2] H01H *73/08*
U.S. Cl. 335—202 **17 Claims**



1. A circuit breaker comprising a housing, contact means movable in the housing between an open circuit position and a closed circuit position, means biasing the contact means to said open circuit position, control means operable for normally holding the contact means in said closed circuit position, said control means having a tripping portion to be moved for permitting the contact means to move to said open circuit position in response to said contact biasing means, a magnetic actuator coil, a frame of magnetic material forming a magnet pole face, said frame supporting the coil to be responsive to conditions in the breaker circuit for establishing a magnetically attracting

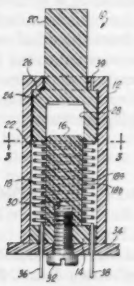
force at said pole face corresponding to conditions in said breaker circuit, first abutment means on said housing engaging the frame to mount the frame with said pole face precisely positioned in the housing, an arm magnetically movable from a rest position spaced from said pole face to an actuating position engaging said pole face on the occurrence of selected conditions in the breaker circuit for moving the tripping portion of the linkage means to permit automatic opening of the breaker circuit on the occurrence of said selected circuit conditions, means biasing the arm to said rest position, and second abutment means on the housing engaging the arm to mount the arm in the housing in a precise position relative to said pole face for pivotal movement between said rest and actuating positions.

4,085,394

CONTACTLESS KEY SWITCH

Lawrence P. Weisenburger, Coeur D'Alene, Id., assignor to Clare-Pendar Co., Post Falls, Id.

Filed Oct. 14, 1976, Ser. No. 732,377
Int. Cl.[2] H01F *21/00*
U.S. Cl. 336—20 **8 Claims**



1. A variable inductance key switch assembly for use with an inductance responsive circuit comprising:

a push button actuating element digitally operable to at least a first undepressed position and a second depressed position;

variable inductor means for resiliently biasing said push button actuating element in said first undepressed position and for providing a first inductance value when said push button actuation element is in said first undepressed position and a second inductance value when said push button actuator is in said second depressed position, said variable inductor means including a compressible coil spring fabricated from a resilient electrically conductive material coupled to said push button actuating element and exerting a resilient biasing force on said push button actuating element for biasing said push button actuating element in said first undepressed position, said push button actuating element being digitally movable to said second depressed position against the resilient biasing force exerted by said coil spring and operative to compress said coil spring to alter the inductance of said coil spring, said coil spring having an inductance value related to the position of said actuating element;

means for supporting said push button actuating element and said coil spring; and

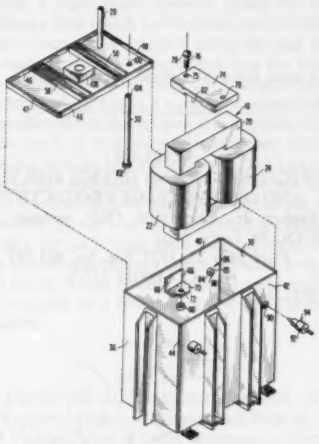
means for providing an electrical connection to said coil spring.

4,085,395

HIGH VOLTAGE TRANSFORMER PACKAGE

Wilfred Jerome Billerbeck, Silver Spring, and Nelson Mortimer Jacobus, Jr., Kensington, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Feb. 3, 1977, Ser. No. 765,329
Int. Cl.[2] H01F *27/02, 27/08*
U.S. Cl. 336—61 **9 Claims**



1. In a high voltage transformer package comprising:

a metal case,

a transformer coil and core assembly fixedly positioned within said case,

a dielectric liquid media within said sealed case with said transformer assembly immersed therein, and

terminals electrically connected to said transformer coils and electrically insulatively and sealably projecting through the walls of said case,

the improvement wherein:

said case comprises thin-wall sheet steel in the form of a closed box having longitudinally opposed end walls, laterally opposed sidewalls, and a bottom wall, said walls having their confronting edges welded together, and a cover welded about its edges to the top edges of said case sidewalls and said end walls,

a plurality of reinforcing members comprising integral angled base and fin portions mechanically fixed by their base portions at positions internally of the case corners to at least some of the exterior walls of said box to resist internal dielectric liquid pressure loading of the thin-wall sheet steel case wall during transformer operation under varying ambient conditions;

and wherein at least some of said reinforcing members are formed of sheet metal which is softer and of higher thermal conductivity than the thin-wall sheet steel forming said case box and cover to facilitate heat dissipation of said transformer package.

4,085,396

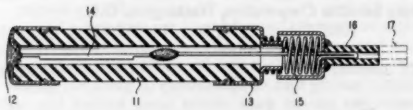
ELECTRIC FUSE

Jacques Armand Augis, Pickerington, Ohio; Ho Sou Chen, Warren, and Harry John Leamy, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 27, 1976, Ser. No. 726,602
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—290 **6 Claims**

1. An electric fuse comprising an elongated metallic fuse

element which is electrically connected at its extremities to first and second contact means, characterized in that said fuse



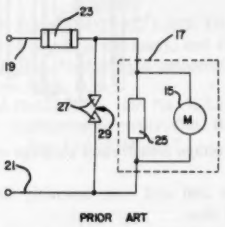
element is in an essentially glassy metallic state.

4,085,397

ELECTRICAL SWITCHING DEVICE FOR THERMAL AND OVERVOLTAGE PROTECTION

Charles Yagher, Jr., Centerville, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 31, 1977, Ser. No. 801,747
Int. Cl.² H01H *37/76*
U.S. Cl. 337—407 **8 Claims**



PRIOR ART

1. A normally open, temperature-sensitive, electrical switching device, having first and second current carrying electrical leads, for completing an electrically conductive circuit between the first and second electrical leads when the temperature of the switching device exceeds a predetermined level and for providing an air gap which permits current to flow between first and second current carrying electrical leads when the voltage across said first and second electrical leads is sufficient to cause arcing across said air gap, comprising:

a first electrically conductive electrode means including a case having a first end defining an opening into a central cavity and a second end which is closed, said first electrode means being electrically connected to said first electrical lead,

a second electrically conductive electrode means electrically connected to said second lead,

nonconductive means for mounting said second electrode means such that it extends into said central cavity, said nonconductive means sealing said opening into said cavity,

a heat fusible, electrically conductive pellet positioned in said central cavity in electrical contact with said second electrode means; and

insulator means, positioned between said conductive pellet and said first electrode means, for holding said pellet out of electrical contact with said first electrode means and defining an air gap therebetween of predetermined dimension,

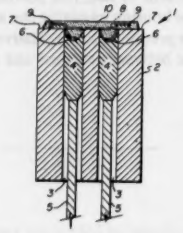
whereby an open electrical circuit will be maintained between said first and second electrical leads until said predetermined temperature level is reached and said fusible pellet melts, forming an electrical connection between said first and second electrode means, or until the voltage across said air gap exceeds the voltage level required for arcing thereacross.

4,085,398

THIN FILM RESISTANCE TEMPERATURE DETECTOR

Robert W. Bertram, Burlington; Graham Norgate, Oakville, and Robert Isles, Mississauga, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jun. 9, 1977, Ser. No. 805,134
Claims priority, application Canada, Jun. 30, 1976, 256112
Int. Cl.² H01C *10/16*
U.S. Cl. 338—25 **12 Claims**



1. A resistor temperature detector comprising:

substrate means of refractory dielectric material having at least two spaced holes through the length of the substrate means;

plug means of electrical conducting alloy fixed in each of the holes in proximity to one end surface of the substrate means, the alloy including a predetermined metal;

a lead wire made of the predetermined metal located within each of the holes from the other end surface of the substrate means and connected to the plug means; and

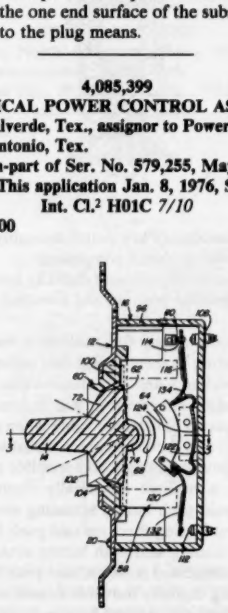
film means of temperature dependent resistor material deposited on the one end surface of the substrate means and connected to the plug means.

4,085,399

ELECTRICAL POWER CONTROL ASSEMBLY

Bill R. Wall, Bulverde, Tex., assignor to Power Controls Corporation, San Antonio, Tex.

Continuation-in-part of Ser. No. 579,255, May 20, 1975, Pat. No. 3,990,033. This application Jan. 8, 1976, Ser. No. 647,640
Int. Cl.² H01C *7/10*
U.S. Cl. 338—200 **23 Claims**



1. In an electric power control device having a control circuit which includes a resistive element and a pair of switch contacts for respectively shunting and opening the control circuit, the improvement comprising an electrically non-conductive housing, a circuit board positioned within the housing on which said control circuit is mounted, means mounting the resistive element for exposure on one side of said circuit board along a track path, a common switch operating member

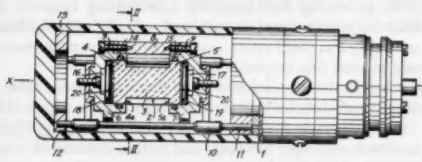
mounted on the circuit board and carrying said pair of switch contacts in spaced relation to each other, a manual controller, means pivotally mounting the manual controller for displacement between limit positions in which the common operating member is engaged to alternately shunt and open the control circuit, and wiper means mounted on the controller for contact with said resistive element along the track path during displacement of the controller between said limit positions to vary the power supplied to a load.

4,085,400

UNDERWATER PIEZOELECTRIC TRANSDUCERS

Philippe Henri Maurice Cluzel, and Michel Georges Quivy, both of Six Fours les Plages, France, assignors to Etat Francais, Paris, France

Filed Apr. 20, 1976, Ser. No. 678,724
Claims priority, application France, Apr. 24, 1975, 75 12745
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340—10 **9 Claims**



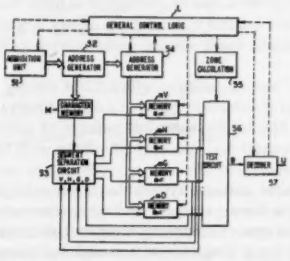
1. A process for emitting or receiving acoustical waves by means of a piezoelectric transducer comprising: a piezoelectric element having an electrical axis, two ends axially opposite and perpendicular to said axis, and an outer and lateral surface parallel to said axis, and two rigid discs each having an inner face and an outer face planar and parallel with each other, the surface of the faces being greater than the cross section of said piezoelectric element by a plane perpendicular to said electrical axis, each of said discs being fastened to one end of said piezoelectric element by the inner face thereof, said process comprising exciting simultaneously said piezoelectric element in both transverse and longitudinal vibratory modes, the active surfaces being only said outer and lateral surface of said piezoelectric element, said inner faces of said disks extending outwardly beyond said lateral surface of said piezoelectric element, and decoupling acoustically said outer faces and said lateral surfaces of the two discs.

4,085,401

CHARACTER RECOGNITION SYSTEM

Alain Chehikian, Grenoble, and Gerard Bouvier, Sassenage, both of France, assignors to Agence Nationale de Valorisation de la Recherche, France

Filed Feb. 10, 1976, Ser. No. 656,905
Claims priority, application France, Feb. 14, 1975, 75 04584
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AE **6 Claims**



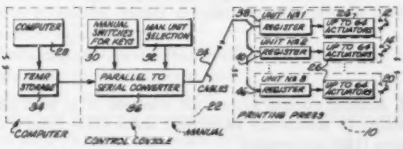
1. Character recognition system for processing binary data defining a character under the form of a block shaped area within which the character is contained in a smaller block shaped area, the block shaped area being divided into a plurality of rows of elemental areas arranged in matrix fashion, each elemental area having an address and corresponding to a binary data which defines a point of the character when the said binary data has a predetermined value, said system comprising: first circuit means for detecting along which of a plurality of directions the character is oriented at each of the respective points thereof; a plurality of memory means for separately storing the binary data which define those points of the character where the character is oriented along the said respective directions; second circuit means for defining the said smaller block shaped area and for defining, by zone addresses within said smaller block shaped area, a number of pluralities of zones of the said smaller block shaped area which equals the number of directions, each of said pluralities of zones covering the whole of the said smaller block shaped area; third circuit means for comparing the addresses of the zones of the respective pluralities to the addresses of the points contained in the respective memory means and for generating a predetermined binary variable for each zone each time addresses of points contained in one of said memory means coincide with the zone address; and fourth circuit means providing an identification of the character signal, as a function of the said predetermined binary variables.

4,085,402

MULTIPLEXING OF ACTUATOR CONTROL SIGNALS

Algirdas J. Krygeris, Richmond Heights, and John M. Manring, Cleveland Heights, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Continuation of Ser. No. 378,832, Jul. 13, 1973, abandoned. This application Jun. 2, 1975, Ser. No. 582,713
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—163 **8 Claims**



1. Apparatus having a plurality of actuators, each comprising a movable mechanical part, said actuators being individually operable to vary an operating condition of the apparatus, said apparatus being arranged in a plurality of groups with each group having a plurality of said actuators therein and each of said groups having a respective binary data shift register with the respective shift register having data storage portions each of which correspond to an individual one of the actuators, each data storage portion being settable to selectively indicate movement of the respective actuator or no movement of the actuator, a control station remote from said actuators, a data transmission line for serially transmitting data to said shift registers from said control station and connected to each of said registers, addressing means for cyclically addressing each of said storage registers in sequence, register loading and control means associated with each of said shift registers and each connected to said addressing means and to said data transmission line for loading the associated shift register when addressed by said address means and operable to set said register to indicate no movement of the corresponding actuators in the absence of data on said data transmission line for the shift register, data means at said remote control station for establishing command data for commanding movement of one or more selected actuators within a selected group during each addressing cycle while such command data is established, and transmitting means operating in synchronism with said addressing means to transmit established command data during each addressing cycle when the selected register is addressed,

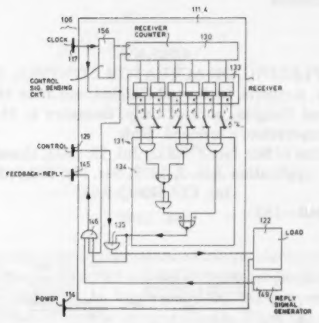
whereby said addressing means and said transmitting means and said loading and control means are operable to refresh or change the data in the selected register during each cycle of said addressing means independently of sensing the position or movement of the actuators, and means connecting each of said actuators of a group to its respective data portion of the corresponding shift register for effecting a fixed increment of movement of the actuator during the cycle time between successive addressing of the shift register by said addressing means when commanded by the data in the respective data storage portion.

4,085,403

COMBINED ON-BOARD REMOTE CONTROL ENERGY SUPPLY DISTRIBUTION AND SIGNALING SYSTEM, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Werner Meier; Walter Hofer, both of Schwabach; Georg Haubner, Berg, and Albert Weckenmann, Oberasbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 13, 1976, Ser. No. 648,783
Claims priority, application Germany, Jan. 30, 1975, 2503679
Int. Cl.² H04Q *11/04*
U.S. Cl. 340—168 R **26 Claims**



1. Remote control system for selection of at least one of a plurality of selectively switchable loads (122) from a central station (110) comprising

a plurality of selectively operable load control switch means (123) to selectively address selected loads and command occurrence of a switching function;

a bus system (106) connected to said central station (110) having a power bus (114), a clock bus (117), a load switching control bus (129), and a load acknowledge feedback and reply bus (145);

a plurality of load receivers (111) connected to respective loads (122) and to the bus system (106) to effect selectively connection of selected loads to the power bus (106) when connection is selectively commanded by said load switch means, wherein

the central station (110) comprises signal generator means (112, 155) connected to the clock bus (117) of the bus system (106) and providing

(a) a group sequence or cycle of clock pulses collectively forming a selection cycle, and

(b) a control signal separating the selection cycles and having a characteristic different from the clock pulses of the selection cycles;

switching control means (115) connected to and controlled by said switch means (123) selecting and segregating at least one specific pulse within the selection cycle, as determined by the setting of the switch means (123) and applying salt at least one selected specific pulse to the switching control bus (129);

and load acknowledge decoding means (144);

and wherein said receivers (111) each comprise

a receiver counter (130) connected to the clock bus (117) of the bus system (106) and stepping in synchronism with the clock pulses in the selection cycles to progressively count the pulses within a selection cycle;

a decoding circuit (131, 135) connected to the receiver counter (130), the decoding circuit being connected to recognize selected count states or numbers of the receiver counter (130), which selected counter states or numbers are associated with predetermined ones of the receivers and if, and only if, there is coincidence between said selected count of the receiver counter (130) stepping in synchronism with the clock pulses during a selection cycle, and occurrence of a signal on the load switching control bus (129), as applied by said switching control means (123), causing a switching function of the respective switchable load to occur;

electrical reply signal generator means (149) generating a signal to be indicative of response by the respective load to the commanded switching function;

and a reply transmitting logic means (146) connected to the reply bus (145) and to the reply signal generating means (149) providing and applying a switching function acknowledgment signal to said load acknowledge feedback and reply bus (145) synchronously with the occurrence of said at least one respective specific pulse;

and wherein the load acknowledge decoding means (144) of the central station (110) includes coincidence means (121) connected to and controlled by the load acknowledge feedback and reply bus (145) and further connected to and controlled by the switching control means (115) and said load control switch means (123) to be energized by said at least one specific selected pulse from said load switching control means (123) as determined by the setting of the load control switch means (123), said load acknowledge decoding means (144) providing an acknowledgment indication output simultaneously with at least one selected clock pulse of the respective selection cycle;

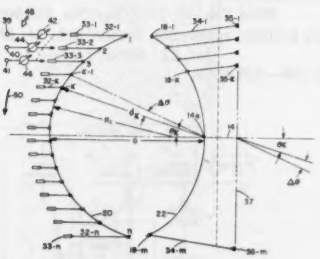
and reply sensing means (148) connected to and controlled by said load acknowledge decoding means (144) and responsive to the acknowledgment indication output to sense that an addressed load has responded by carrying out said commanded switching function.

4,085,404

PHASING OPTIMIZATION AT THE FEED PROBES OF A PARALLEL PLATE LENS ANTENNA

Janice Anne Gallant, Edgewood, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 20, 1976, Ser. No. 752,658
Int. Cl.² H01Q *14/06*
U.S. Cl. 343—754 **6 Claims**



1. A radar antenna system having a microwave lens and including a linear array of radiating elements for radiating energy into space comprising a parallel plate wave conducting means having a longitudinal axis and including a plurality of feed probes located along the focal arc of said lens, a plurality of output probes located along the output contour of said wave conducting means and coupled to said radiating elements, a

source of exciting energy for said feed probes and means connecting said source of exciting energy to said feed probes and having an electrical length equal to:

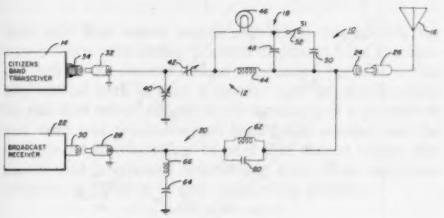
$$A + \frac{2\pi}{\lambda}(d_k - G)$$

where λ is the wavelength of said exciting energy, G is the linear distance between the intersections of said longitudinal axis with said focal arc and said output contour, d_k is the linear distance between the k^{th} feed probe and the intersection of said longitudinal axis and said output contour, and A is a constant electrical length.

4,085,405
ANTENNA MATCHING NETWORK

Edson L. Barlow, Rochester, Mich., assignor to MHz Enterprises, Inc., Utica, Mich.

Filed Nov. 9, 1976, Ser. No. 740,313
Int. Cl.² H01Q 1/50, 9/00
U.S. Cl. 343—858 **3 Claims**



1. A matching network for coupling a broadcast receiver and a communications transceiver having a transmitter and a receiver to a common automotive broadcast antenna, comprising:

a tunable matching section including at least a series arm electrically connectable between the communications transceiver and the broadcast antenna;

an indicator light electrically coupled to said series arm, said indicator light being responsive to the flow of power from said transceiver to said antenna and indicating the state of tune of said matching section;

a blocking circuit connectable between said antenna and said broadcast receiver, said blocking circuit being operative to attenuate the flow of signals having frequencies within the operating frequency range of said transmitter while permitting the flow of broadcast signals from said antenna to said broadcast receiver;

a housing surrounding said matching network and means extending from said housing for disconnectably electrically connecting said matching network to said broadcast antenna, said broadcast receiver and to said transceiver, said indicator light being affixed to said housing in a manner rendering it visible from outside of said housing and said matching section being tunable from outside of said housing;

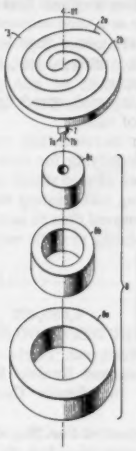
a sensitivity switch electrically coupled to said indicator light, said sensitivity switch being operative from outside of said housing to increase the sensitivity of said indicator light to the flow of power between said transceiver and said antenna to thereby increase the brightness of said indicator light; and

a first capacitor coupling said matching network to said indicator light and a second capacitor coupled to said sensitivity switch, said sensitivity switch being operative to connect said second capacitor in a parallel circuit with said first capacitor to increase the sensitivity of said indicator light.

4,085,406
SPIRAL ANTENNA ABSORBER SYSTEM

John Michael Schmidt, and Wallace Leon Snow, both of Apalachin, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,851
Int. Cl.² H01Q 1/36, 1/42
U.S. Cl. 343—895 **6 Claims**



5. Unidirectional spiral antenna apparatus comprising:

a pair of printed circuit conductors configured as a spiral antenna circuit,

a circular dielectric substrate having said pair of printed circuit conductors mounted thereon,

electric connector means coupled to said printed circuit conductors,

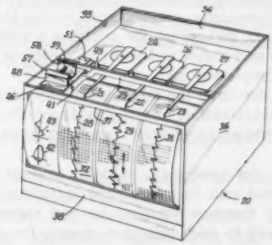
a cylindrical conductor reflector cavity having an open end juxtaposed to said substrate, and

a cylindrical radiation absorber system disposed in said cavity and having a predetermined radial variable radiation absorption density characteristic.

4,085,407
DATA PLOTTER

Robert A. Stratbucker, and John S. Hagood, both of Omaha, Nebr., assignors to Health Technology Laboratories, Inc., Omaha, Nebr.

Filed Apr. 28, 1976, Ser. No. 681,138
Int. Cl.² G01D 9/30; A61B 5/04
U.S. Cl. 346—33 ME **13 Claims**



1. In a multi-channel chart recorder receptive of and operable to record first and second timevariant analog scalar components of ventricular QRS complex input vector data signals on

a moving recording medium, a data plotter for printing QRS vector loops comprising:

stationary printing means having a series of selectively actuable printing elements spaced transversely to the longitudinal axis of said medium;

means for mounting said printing means on the recorder in printing contact with said medium;

means for selecting a time sample of said data signals;

means for storing each of said first and second data for said selected sample as a time sequential series of values;

means for converting said first and second analog scalar components into integer data form in correspondence with said elements;

means for arranging said stored first data as a numerically ordered series of values;

sorting means for incrementally varying said ordered first data and for identifying for each value thereof the time-associated values of said stored second data; and

means for actuating said printing elements corresponding to said identified second data as said medium moves in increments corresponding to value variations of said stored first data.

4,085,408

LIQUID JET RECORDING APPARATUS

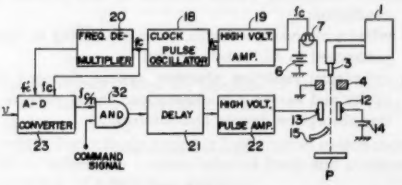
Masayuki Muto, Kawasaki; Norio Tashima, Tokyo; Shozo Kaieda, Yokohama, and Kuniaki Kamimura, Atsugi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 495,540, Aug. 6, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,614

Claims priority, application Japan, Sep. 7, 1973, 48-105327; Sep. 10, 1973, 48-102449; Sep. 10, 1973, 48-106389; Sep. 21, 1973, 48-106733; Oct. 30, 1973, 48-122522; Nov. 10, 1973, 48-126421

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **15 Claims**



1. In an X-Y plotter of the ink jet type including a recording head including a nozzle and a recording medium relatively movable with respect to each other; means for producing a jet of liquid ink discharged from said nozzle along a path toward said recording medium; a gutter disposed adjacent said path; and deflection means adjacent said path for causing a portion of said jet to deflect from said path and pass to said gutter; the improvement comprising:

said jet producing means comprising a ring electrode spaced from and coaxially arranged with respect to an exit end of said nozzle, and means for applying a pulsating voltage between said nozzle and said ring electrode, thereby producing droplets of ink;

means for detecting the relative velocity of movement between said recording head and said recording medium and for generating an electric signal representative thereof; and

said means for applying a pulsating voltage between said nozzle and said ring electrode including pulse voltage applying means, connected to said velocity detecting means and to said deflection means, for receiving said signal and for generating and applying voltage pulses to said deflection means for thereby deactivating said deflection means to prevent deflection of said ink droplets to said qutter and to allow said ink droplets to pass to said recording medium, said voltage pulses being at a frequency proportional to said relative velocity and at times synchronized with the passage of ink droplets past said deflection means, said frequency being $1/n$ times the frequency of said pulsating voltage applied between said nozzle and said ring electrode, wherein n is an integer, and whereby said deflection means is deactivated at a frequency proportional to said relative velocity and, whereby a uniform ink deposit on said recording medium is achieved.

4,085,409

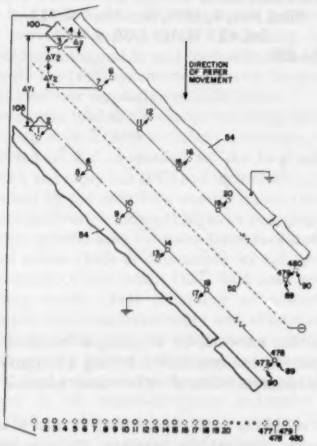
METHOD AND APPARATUS FOR INK JET PRINTING

Suresh C. Paranjpe, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 1, 1976, Ser. No. 691,854

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **12 Claims**



1. An ink jet printer for printing on a moving web upon which are defined a plurality of print positions across the width of the web, adjacent print positions being laterally displaced from each other by a minimal distance such that printing may be accomplished without interruption across the web, comprising:

means for generating a row of drop streams, said row being in a line which is oblique to the direction of web movement,

means for selectively charging each drop in said drop streams to one of a plurality of charge levels,

a catcher extending parallel to said row, and

means for generating a drop deflecting field substantially perpendicular to said row and of appropriate magnitude that the drops in each of said drop streams may be directed to strike the web at one of a plurality of print positions or may be sufficiently deflected to strike said catcher, each drop stream servicing a plurality of adjacent print positions across the width of the web.

4,085,410

PHOTOFLASH MOUNTING AUTOMATIC LIGHT CONTROL CAMERA

Keisuke Maeda, Osaka, and Akira Yamanaka, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 20, 1976, Ser. No. 688,218

Claims priority, application Japan, May 30, 1975, 50-65931

Int. Cl.² G03B *7/18*

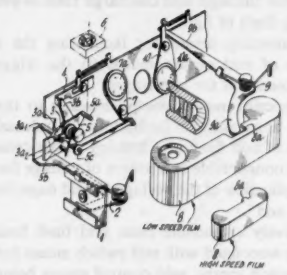
U.S. Cl. 354—21 **11 Claims**

1. A photographic camera having a first mount for releas-

ably accepting a photoflash unit with a predetermined high guide number and a second mount for releasably accepting a photoflash unit with a predetermined low guide number, said camera including an automatic light control which comprises:

a first sensor means being displaceable upon mounting of a photoflash unit with said predetermined high guide number on said first mount; and

a first luminosity attenuating filter operatively connected



with said first sensor means and being displaceable between a non-attenuating position displaced from the optical path of the camera and an attenuating position within said optical path in such a manner that the displacement by said first sensor means of the mounting of a photoflash unit with said predetermined high guide number and the consequent displacement of said first sensor means displaces said luminosity attenuating filter from said non-attenuating position to said attenuating position.

4,085,411

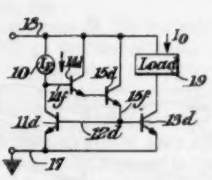
LIGHT DETECTOR SYSTEM WITH PHOTO DIODE AND CURRENT-MIRROR AMPLIFIER

Robert Charles Genesi, Sterling, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 16, 1976, Ser. No. 677,573

Int. Cl.² G03B *7/08*; H01J *39/12*; H01L *29/72*

U.S. Cl. 354—51 **16 Claims**



1. A light detector system comprising a silicon photo-diode and a semiconductor integrated current-mirror circuit to provide amplification of the photo current generated by said photo-diode, said current-mirror amplifier circuit having at least one stage comprising a pair of d.c. power supply terminals, a bipolar output transistor and a bipolar input device having at least one p-n junction, said photo-diode being directly connected between said input device and one of said power supply terminals forming a series circuit wherein said photo-diode and said p-n junction are series connected with opposite polarities between said power supply terminals, the emitter of said output transistor being connected to the other of said power supply terminals, the base-emitter junction of said output transistor being directly connected in parallel with said at least one junction of said input device and in the same polarity, the area of said base-emitter junction of said output transistor being greater than the area of said at least one junction of said input device to provide a current gain in said at least one stage greater than 1.0, a circuit connection being made between the collector of said output transistor and said one terminal of said d.c. power supply to provide a path through which said amplified photo current will flow.

4,085,412

DEVICE FOR RECORDING INFORMATION ON A FILM IN A PHOTOGRAPHIC CAMERA

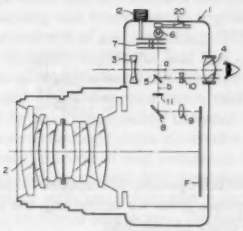
Takeshi Yoshino, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Feb. 3, 1976, Ser. No. 654,757

Claims priority, application Japan, Feb. 4, 1975, 50-16683[U]; Feb. 17, 1975, 50-21674[U]; Aug. 20, 1975, 50-100906

Int. Cl.² G03B *17/24*

U.S. Cl. 354—106 **25 Claims**



1. A device for recording information on part of a film loaded in a camera in addition to the image of an object to be photographed on the film comprising:

a light source provided in the camera,

information carrying means located in the camera at a position to receive the light from said light source, said information carrying means carrying thereon information to be recorded on a part of a film loaded in the camera,

a viewfinder system provided in the camera including an eyepiece and an objective,

a half-mirror disposed between said eyepiece and said objective to partly reflect the light from said information carrying means directly toward said eyepiece of the viewfinder to form a first light beam for viewing information and partly transmit therethrough the light from said information carrying means to form a second light beam for recording information,

a mirror located in the optical path of the second light beam to reflect the light from the half-mirror toward a part of a film in the camera,

a focusing optical element provided in the optical path of the second light beam for focusing an image of the information on the film,

a first light intercepting shutter means provided in the camera to prevent the light from said image of the object to be photographed from reaching the film when recording of the object image is not desired; and

a second light intercepting shutter means is provided in the second light beam to prevent the light from the half-mirror from reaching the film when the recording of the information is not desired.

4,085,413

APPARATUS FOR RETARDING CAMERA SHUTTER RELEASE

Tohru Karikawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1976, Ser. No. 749,564

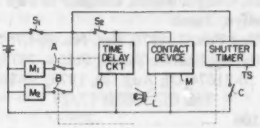
Claims priority, application Japan, Dec. 12, 1975, 50-167949[U]

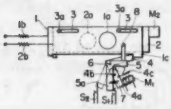
Int. Cl.² G03B *9/64*

U.S. Cl. 354—137 **4 Claims**

1. An apparatus for retarding the release of a camera shutter, comprising:

(a) movable, spring biased shutter means,
(b) a pivotal locking lever for holding the shutter means in a cocked position,
(c) a pivotal release lever,
(d) a spring coupling the locking lever to the release lever,
(e) an electro-magnet for preventing the rotation of the locking lever when energized,





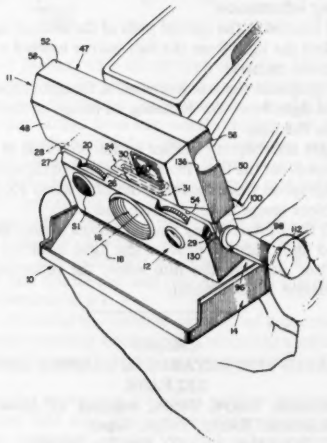
(f) a first switch operable in response to the initial movement of the release lever for energizing the electro-magnet,
(g) a time delay circuit, and
(h) a second switch operable in response to the further movement of the release lever for actuating the time delay circuit, whereby the output from the latter deenergizes the electro-magnet and the spring rotates the locking lever to release the shutter means.

4,085,414

ELECTRONIC FLASH APPARATUS WITH EXTENDABLE ON/OFF SWITCH CONTROL APPARATUS

John P. Burgarella, Sudbury; George Turner, Jr., Newton, and Robert L. Stephansky, Stoughton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 10, 1976, Ser. No. 749,313
Int. Cl.[2] G03B *15/03, 17/02;* H01H *3/16*
U.S. Cl. 354—145 23 Claims



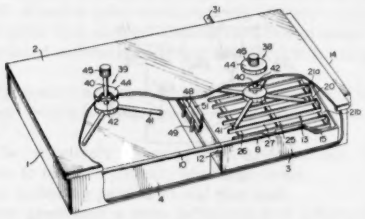
1. An electronic flash unit for use with a camera of the type which may be held by a user in a normally expected manner and which includes means for providing a flash fire trigger signal at an appropriate time during a photographic exposure interval together with connecting apparatus for accommodating the removable fixed connection of said flash unit with respect to the camera, said flash unit comprising:
a housing;
a storage capacitor;
a flash discharge tube;
means responsive to an applied voltage for charging said capacitor;
circuit means responsive to the trigger signal for discharging said capacitor through said discharge tube to produce an illuminating flash of light;
electrical connecting means for facilitating the electrical connection of said circuit means to the trigger signal providing means of the camera;
physical connecting means complementary to the camera connecting apparatus for facilitating the releasable fixed connection of said flash unit housing to the camera;
switch means connectable to a source of voltage for controlling the application of the voltage to said capacitor charging means; and
means selectively extendable from said flash housing and operatively associated with said switch means for controlling said switch means, said control means being extendable, subsequent to the fixed connection of said flash housing to the camera, into interfering relation with at least a portion of the area otherwise expected to be occupied by the user's hand when holding the camera in its normal manner, said control means thereby being extendable into position to be engaged by the user's hand when holding the camera and also being responsive to such engagement by the user's hand as to cause said switch means to apply voltage to said capacitor charging means.

4,085,415

PHOTOGRAPHIC PROCESSING APPARATUS

Masai Ikechi, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed May 6, 1976, Ser. No. 683,645
Int. Cl.[2] G03D *17/00, 13/02*
U.S. Cl. 354—316 7 Claims



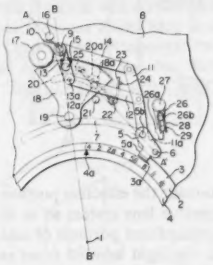
1. A photographic processing apparatus comprising:
a casing,
developing means and fixing means in said casing,
carrier means in the form of a movable plate having a latticed framework for carrying a sheet of printing paper from said developing means to said fixing means,
means for moving said carrier means between said developing means and fixing means,
said plate having raised portions thereon for pushing a sheet on said plate forward when said carrier means is moved from said developing means to said fixing means,
guiding means for guiding said carrier means between said developing means and said fixing means, and
stopper means for catching the sheet of printing paper on said carrier means and causing the same to drop into said fixing means when said carrier means is returned from said fixing means back to said developing means.

4,085,416

APERTURE INTERLOCKING DEVICE FOR A SINGLE LENS REFLEX CAMERA OF THE INTERCHANGEABLE VIEWFINDER TYPE

Sunao Ishizaka, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 749,047
Claims priority, application Japan, Dec. 9, 1975, 50-150586
Int. Cl.[2] G03B *13/02*
U.S. Cl. 354—219 6 Claims



1. An aperture interlocking device for a single lens reflex camera wherein a pantograph mechanism has one lever biased in one direction within a viewfinder detachable with respect to the body of the camera is connected to an engaging portion of the aperture ring of the picture-taking lens during the mounting of the viewfinder to the camera body so that the aperture information of the picture-taking lens is transmitted to an exposure control device by displacement of the pantograph mechanism, the improvement comprising:

first guide means (**12***a*, **20**) for guiding said pantograph mechanism (**9**, **10**, **11**, **12**, **13**, **14**);

a first pin (**6**) on one lever (**11**) of said pantograph mechanism and rotatable about the optical axis (**1**) of said picture-taking lens;

an engaging member (**5**) engageable with the engaging portion (**3**) of said aperture ring (**2**) and supported for rotation one said one lever (**11**) of said pantograph mechanism; and

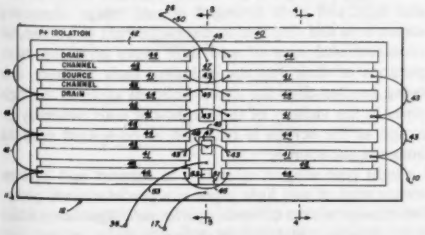
second guide means (**7**, **5***b*) for guiding said engaging member (**5**) so that the engaging member is rotated about said optical axis of said picture-taking lens.

4,085,417

JFET SWITCH CIRCUIT AND STRUCTURE

Sam S. Ochi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 27, 1976, Ser. No. 754,482
Int. Cl.[2] H01L *27/02*, *27/10*, *27/04*, *29/72*
U.S. Cl. 357—43 4 Claims



1. An integrated circuit combination including a switching JFET, a driver JFET, and a bipolar control transistor located in a common isolated tub, said integrated circuit comprising:

a semiconductor substrate of a first conductivity type;

an epitaxial layer of a second conductivity type deposited upon said substrate;

an isolation ring of said first conductivity type diffused completely through said epitaxial layer, thereby to definea said tub region of epitaxial layer isolated by the p-n junction thus created from the remainder of the structure;

a first series of elongated regions of said first conductivity type established in said tub extending from the surface of said epitaxial layer part way through the thickness thereof, and means coupling said first series together to establish the source electrode of said switching JFET;

a second series of elongated regions of said first conductivity type established in said tub extending to substantially the same depth as said first series and arranged to flank in parallel configuration said first series of elongated regions, and means coupling said second series together to establish the drain electrode of said switching JFET;

a third series of elongated regions of said first conductivity type estabished to extend a lesser distance into said epitaxial layer than said first and second series, said third series being arrayed to span the spacing between the parallel array of said source and said drain electrodes and to constitute the channel portion of said switching JFET;

a pair of diffused regions of said first conductivity type in said tub, extending sufficiently into said epitaxial layer to provide bipolar transistor base action, the first of said pair lying completely inside said isolation ring and the second overlapping said isolation ring to provide contact thereto, said pair being spaced apart to have parallel confronting edges of sufficient width to provide the desired channel width of said driver JFET, said pair being spaced apart by a distance to provide the desired channel length of said driver JFET;

a layer of said first conductivity having a depth and doping concentration similar to that of said third series of elongated regions, said layer spanning the separation between said confronting edges of said pair of diffused regions to provide the channel portion of said driver JFET;

an emitter region of said second conductivity type diffused within the confines of said first of said pair of diffused regions;

an ohmic contact heavily doped to provide conductivity of said second type located on said epitaxial material inside said isolation ring; and

means for coupling conductive contacts to said emitter region, said ohmic contact, said first of said pair of diffused regions, and said substrate to provide connections respectively to said bipolar transistor emitter along with the source of said driver JFET, said bipolar transistor collector along with the gate connections to said switching JFET and said driver JFET, and said drain of said driver JFET along with said substrate.

4,085,418

COLOR IMAGE PICK-UP SYSTEM USING STRIP FILTER

Yoshihiro Uno, c/o Matsushito Research Institute, Inc., No. 1006, Oaza Kadoma, Kadoma City, Osaka, Japan

Division of Ser. No. 450,850, Mar. 13, 1974, Pat. No. 3,935,588, Continuation of Ser. No. 245,085, Apr. 18, 1972, abandoned.
This application Nov. 22, 1975, Ser. No. 624,930
Claims priority, application Japan, Apr. 20, 1971, 46-25883; Apr. 20, 1971, 46-25884; Apr. 20, 1971, 46-25885
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.[2] H04N *9/07*
U.S. Cl. 358—44 6 Claims

1. A color television system comprising, in combination:

(a) a color television camera tube including an evacuated envelope having a faceplate at one end, an electron gun at the other end of said envelope, a color filter element disposed on said faceplate and a photoelectrical element

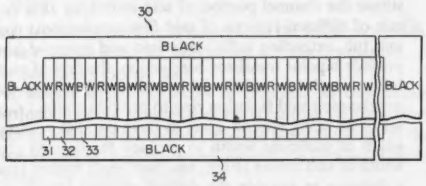
disposed inwardly of said color filter element, means for scanning electrons from said electron gun in a given direction, said color filter element comprising in combination therewith;

a plurality of transparent or white strips extending in a direction normal to said given direction to produce from said photoelectrical element upon scanning of said electrons a luminance signal; and

color strips of first and second colors arranged in alternating succession with said transparent or white strips and in recurrent groups to thereby produce two color signals from said photoelectrical element upon scanning of said electrons thereacross; and

(b) an output impedance connected to said color camera tube; and

(c) signal processing circuit means, including color encoding means, coupled to said output impedance and responsive to an image signal appearing thereacross for developing a composite color video signal therefrom, said signal processing circuit means including a first sampling pulse generating means for producing three sampling pulse trains each having respectively the same phase and frequency as one of said luminance signal and said two color signals, sampling means for sampling the image signal with said three sampling pulse trains so as to separate the luminance and the color signals from the image signal, and matrix and modulating means for converting the separated luminance and color signals into said composite color video signal, said modulating and matrix means comprising said color encoding means, and wherein said sampling pulse generating means includes a differentiator for differentiating the image signal, a cut-off and limiting circuit for cutting off negative portions of the differentiated image signal and for amplifying and limiting the differentiated and cut-off image signal so as to convert the differentiated and cut-off image signal into a reference pulse signal, a first sampling pulse generator for repeatedly producing a first sampling pulse at each of trailing edges of pulses of said reference pulse signal, a second sampling pulse generator for repeatedly producing a second sampling pulse at each of leading edges of alternate pulses of said pulse signal, and a third sampling pulse generator for repeatedly producing a third sampling pulse at each of leading edges of the remaining pulses of said pulse signal alternate with said alternate pulses.



4,085,419

COLOR TELEVISION CAMERA

Takeshi Sekiguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1976, Ser. No. 747,881

Claims priority, application Japan, Dec. 8, 1975, 50-165526[U]

Int. Cl.² H04N 9/09

U.S. Cl. 358—55 **10 Claims**

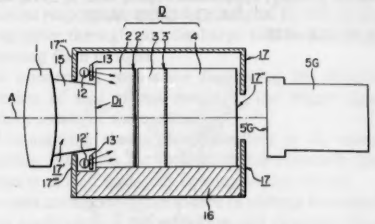
1. A color television camera comprising:

an objective lens system;

a color separating prism system having an entrance surface for an image forming light beam, chamfered portions contiguous to said entrance surface, and a plurality of exit surfaces, said prism system being so disposed that said entrance surface may be optically opposed to said objective lens system;

a plurality of image pick-up tubes, each of which is disposed in an optically opposed relationship to each of said plurality of exit surfaces of said objective lens system; and

means to emit light, said light emitting means being disposed at a position outside the effective portion of the light beam from said objective lens system so as to be optically opposed to said chamfered portions of said color separating prism system, the light emitted from said light emitting means being projected into said color separating prism system from said chamfered portions, after which it is projected into each of said image pick-up tubes.



4,085,420

LIGHT PIPE IMAGE DISPLAY

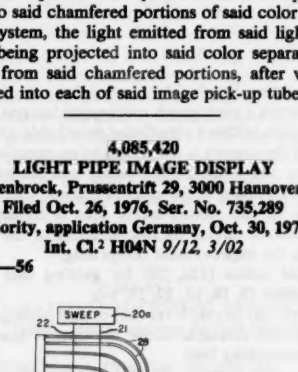
Heiner Stukenbrock, Prussentrift 29, 3000 Hannover, Germany

Filed Oct. 26, 1976, Ser. No. 735,289

Claims priority, application Germany, Oct. 30, 1975, 2548589

Int. Cl.² H04N 9/12, 3/02

U.S. Cl. 358—56 **5 Claims**



1. Apparatus for displaying on a screen an image taken from an image source supplying light components forming elements of the image, the apparatus comprising:

(a) an image composing screen area;

(b) separate light pipes for said light element components of the image, the light pipes including light entrance ends and light exit ends arranged at said image composing screen area and disposed to discharge light therefrom, the cross-sectional area of said light pipes over the major portions of their lengths including their entrance ends being smaller than the cross-sectional areas of the light pipes in the vicinity of their light exit ends, whereby the image at the screen is enlarged as compared with the image at the source;

(c) a light pipe support operative to support said light entrance ends of said light pipes in a predetermined path;

(d) said image source comprising a focused light beam which is brightness modulated according to light element components of the source image, a scanning mirror which is disposed to deflect the beam toward said light pipe support, and means for simultaneously rotating the mirror and shifting it back and forth with respect to its rotational

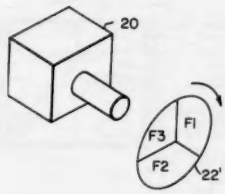
axis to scan the beam progressively along said predetermined path and into the entrance ends of the light pipes; and

(e) said light pipe support being curved about said rotational axis and supporting said entrance ends facing into the modulated beam as it is scanned along said predetermined path, thereby to compose the elements of said image in said screen area.

4,085,421
UNDERWATER VIEWING SYSTEM

George A. Gilmour, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1976, Ser. No. 703,157
Int. Cl.[2] H04N 9/02, 9/04
U.S. Cl. 358—81 8 Claims



1. An underwater viewing system comprising:

A. TV camera means for viewing an underwater scene and developing three color signals indicative thereof;

B. three optical color filters positioned relative to said TV camera means that said color signals are respectively indicative of the color passed by said filters;

C. each said filter being of a type to pass a subrange of colors in the range of colors passed by the water medium between said scene and said TV camera means with two of said filters being other than primary color filters;

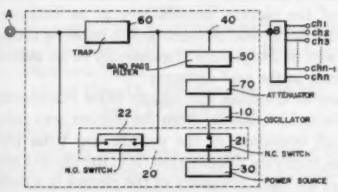
D. color TV display means including color phosphors; and

E. means responsive to said color signals for selectively energizing said phosphors.

4,085,422
FEE-CHARGING APPARATUS FOR TELEVISION SETS

Tatuji Niwata, Kawakita; Kazutomo Okubo, Kanazawa; Fumio Nakanishi, Matsuto, and Masanori Yamada, Kanazawa, all of Japan, assignors to Hokuryo Denko Co., Ltd., Japan

Continuation-in-part of Ser. No. 513,631, Oct. 10, 1974, abandoned. This application Jun. 30, 1976, Ser. No. 701,106
Claims priority, application Japan, Oct. 31, 1973, 48-126191; Nov. 27, 1973, 48-137042
Int. Cl.[2] H04N 1/44
U.S. Cl. 358—118 7 Claims



1. Apparatus for use with a plurality of television receivers, each adapted to receive first television signals from non-fee-charged stations and display images in response thereto on their respective first set of channels, said first signals being received at a common antenna and each receiver having an antenna input terminal, said apparatus comprising:

privately programmed transmitter means for generating second television signals from a fee-charged station having an audio portion and a video carrier signal different from the carrier signals associated with said first set of channels;

coupling circuit means receiving said first and second television signals and for combining said signals and for coupling said combined signals to a common terminal; and

a fee-charging unit for each receiver connected between coupling means and said antenna input terminal of an associated receiver, each unit comprising:

trap circuit means receiving said combined signals from said common terminal for blocking transmission of the carrier signal of said second television signals;

an oscillator circuit for generating a sinusoidal local carrier signal of substantially the same frequency and amplitude as the video carrier signal of said second television signals;

band pass filter circuit means receiving the output of said oscillator circuit for rejecting harmonic signals of said local carrier signal;

switch means selectively actuatable for a predetermined time in circuit with said oscillator for inhibiting said oscillator from generating said local carrier signal when actuated; and for deactivating said trap circuit means when actuated to thereby permit passage of said second television signals; and

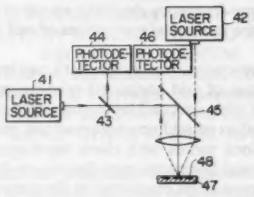
a mixer circuit receiving the output signals of said trap circuit and said filter circuit means for coupling said signals to said antenna input terminal of the associated receiver;

whereby each receiver normally receives said first television signals without interference and normally receives the audio portion and mixed carrier signals of said television signals and said local carrier signal except when said switch means is actuated during which predetermined time, said oscillator circuit is inhibited from generating said local carrier signal.

4,085,423
INFORMATION REPRODUCING APPARATUS WITH PLURAL BEAM READOUT

Yoshito Tsunoda, Mitaka; Takeshi Maeda, Kokubunji, and Yoshitada Oshida, Sayama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1976, Ser. No. 691,099
Claims priority, application Japan, Jun. 6, 1975, 50-67643
Int. Cl.[2] A04N 5/76
U.S. Cl. 358—128 14 Claims



1. Information reproducing apparatus comprising:

first light source means for producing a first light beam having a predetermined wavelength,

second light source means for producing a second light beam having a wavelength different from that of said first light beam,

a recording medium having an information track,

an optical system including first means for conducting said first and second light beams to said information recording medium and wavelength selective optical means mounted for movement to follow said track and positioned in the

paths of said first and second light beams for reflecting said first light beam and transmitting said second light beam,

a first detector positioned to receive the first light beam reflected by said information recording medium after being again reflected by said wavelength selective optical means, and

a second detector positioned on the opposite side of said wavelength selective optical means from said information recording medium to receive the second light beam reflected by said information recording medium after being again transmitted through said wavelength selective optical means.

4,085,424

PHASE-COMPARISON LOGIC CIRCUIT FOR DUAL SIGNAL TELEVISION RECEPTION

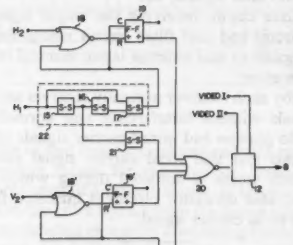
Dennis Cota, VS-Villingen, Germany, assignor to Saba Schwarzwaelder Apparate-Bau-Anstalt August Schwer Soehne GmbH, Villingen-Schwenningen, Germany

Filed Mar. 17, 1977, Ser. No. 778,579

Claims priority, application Germany, Jun. 18, 1976, 2627338; United Kingdom, Oct. 13, 1976, 41658/76

Int. Cl.[2] H04N *5/04*

U.S. Cl. 358—181 **7 Claims**



1. A phase-comparison logic circuit for use in a television receiver to provide a bi-level switching signal one level of which agrees with periods of time during which the video signal corresponds to a quadrant of a first broadcast television program, said quadrant being free from the horizontal and vertical synchronizing pulses of the video signal of a second broadcast program, comprising:

horizontal-sync-frequency-doubling means with input connected to the horizontal sync pulses of said first broadcast program;

horizontal-syn-comparison means with one input connected to the output of said horizontal-sync-frequency-doubling means and with a second input connected to the horizontal sync pulses of said second broadcast program;

horizontal-clock means with clock input connected to the output of said horizontal-sync-frequency-doubling means and with reset input connected to the output of said horizontal-sync-comparison means;

vertical-sync-frequency-doubling means with input connected to the vertical sync pulses of said first broadcast program;

vertical-sync-comparison means with one input connected to the output of said vertical-sync-frequency-doubling means and with a second input connected to the vertical pulses of said second broadcast program;

vertical-clock means with clock input connected to the output of said vertical-sync-frequency-doubling means and with reset input connected to the output of said vertical-sync-comparison means; and

switch signal means with one input connected to the output of said horizontal-clock means and a second input connected to said vertical clock means and having said bi-level switching signal output.

4,085,425

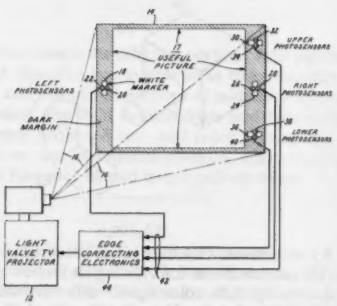
PRECISE CONTROL OF TELEVISION PICTURE SIZE AND POSITION

James S. Hamill, Ormond Beach, Fla., assignor to General Electric Company, Fairfield, Conn.

Filed May 27, 1976, Ser. No. 690,614

Int. Cl.[2] H04N *5/74, 3/22*

U.S. Cl. 358—237 **5 Claims**



1. In a scanned picture presentation device in which the horizontal size of the picture is controllable by horizontal scan size means and the mean horizontal position of the picture is controllable by horizontal scan positioning means, the improvement comprising:

a. means to produce illuminated marker areas outside of the picture indicative of the left and right boundaries of the picture;

b. a plurality of photosensitive transducing means located to receive the illumination from the illuminated marker areas and responsively thereto to produce electrical signals representative of the locations of the illuminated marker areas with respect to the said transducing means;

c. means to combine the signals from transducing means receiving illumination from the marker area indicative of the left boundary of the picture and from transducing means receiving illumination from the marker area indicative of the right boundary of the picture in a first sense to produce a signal indicative of the distance between the said marker areas, and to apply it operatively to cause the horizontal scan size means to reduce the horizontal scan size of the picture responsively to an indication of an increase in the said distance and to increase the horizontal scan size of the picture responsively to an indication of a decrease in the said distance;

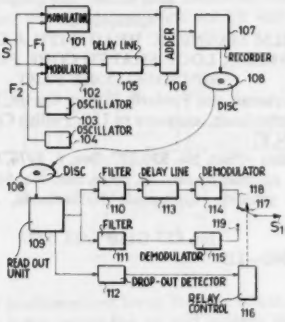
d. means to combine the signals from transducing means receiving illumination from the marker area indicative of the left boundary of the picture and from transducing means receiving illumination from the marker area indicative of the right boundary of the picture in a second sense to produce a signal indicative of the mean horizontal displacement of the said marker areas, and to apply it operatively to the said horizontal scan positioning means to move the picture leftward responsively to a signal indicative of a mean rightward displacement of the said marker areas and to move the picture rightward responsively to a signal indicative of a mean leftward displacement of the said marker areas.

4,085,426

METHOD FOR PROTECTING AGAINST DROP-OUTS IN A SOUND SIGNAL RECORDED ON A VIDEO-DISC

Pierre Aigrain; Georges Broussaud; Jean Paul Peltier, and Erich Spitz, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 1, 1976, Ser. No. 662,688
Claims priority, application France, Mar. 4, 1975, 75 06740
Int. Cl.[2] H04N 5/78
U.S. Cl. 360—38 4 Claims



1. A method for protecting against drop-outs in a sound signal recorded on a video-disc, which comprises the step of:

simultaneously modulating a first and a second sub-carrier signal with said sound signal for providing a first and a second modulated sub-carrier signal;

delaying said second modulated sub-carrier signal by a delay '*r*' for providing a delayed modulated sub-carrier signal, said delay being longer than the duration of the substantially longest of said drop-outs;

recording said first modulated sub-carrier signal and said delayed second modulated sub-carrier signal onto a video-disc;

reading out said video-disc for simultaneously providing the first and the second modulated sub-carrier signal; said first and second sub-carrier signals being typically subject to simultaneous and random distortion by said drop-outs;

delaying said first modulated sub-carrier signal by said delay '*r*' for providing a delayed read and modulated sub-carrier signal;

simultaneously demodulating said second read sub-carrier signal and said first delayed and read sub-carrier signal for providing first and second read signals; and

monitoring said reading out for detecting said drop-outs and substituting said first read signal for said second read signal when said drop-outs occur.

4,085,427

TRANSDUCER POSITIONING SYSTEM

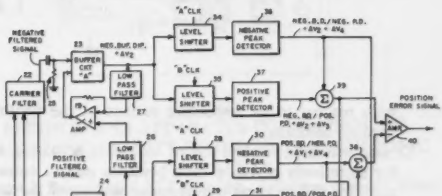
David Dunn, Windham, N.H., assignor to Data General Corporation, Southboro, Mass.

Filed Dec. 13, 1976, Ser. No. 750,287
Int. Cl.[2] G11B 21/10
U.S. Cl. 360—77 9 Claims

1. In a transducer positioning system wherein a transducer is positioned over a magnetic media by sensing position information, the sensed position information consisting of a first plurality of dipulse groups, each group comprising a first dipulse having a first pulse of a first polarity and a second pulse of a second polarity and a second dipulse having a first pulse of the second polarity and a second pulse of the first polarity, and a second plurality of dipulse groups, each group comprising dipulses which are complementary to the first and second dipulses of said first plurality of dipulse groups, a system for detecting certain peak amplitudes within said first and second plurality of dipulse groups comprising

buffer means responsive to said first and second plurality of dipulse groups for providing first and second buffered signals comprising said first and second plurality of dipulse groups, respectively, and first and second offset error signals present therein, respectively, said buffer means including means for making said first and second offset error signals substantially equal;

first peak detection means responsive to said first buffered signal for detecting the peak amplitudes of said first polarity pulses of each of said first dipulses and for detecting the peak amplitudes of said second polarity pulses of each of said second dipulses to provide first and second peak amplitude signals which include said first offset error signal and third and fourth offset error signals, respectively, arising in said first peak detection means;



second peak detection means responsive to said second buffered signal for detecting the peak amplitudes of the polarity pulses which are complementary to said first polarity pulses and for detecting the peak amplitudes of the polarity pulses which are complementary to said second polarity pulses to provide third and fourth peak amplitude signals which include said second offset error signal and fifth and sixth offset error signals, respectively, arising in said second peak detection means;

the peak detection responses of said first and said second peak detection means being matched to produce substantially equal third and sixth offset error signals and substantially equal fourth and fifth offset error signals;

means for combining said first, second, third and fourth peak amplitude signals for producing an output signal in which said offset error signals are minimized.

4,085,428

APPARATUS FOR RECORDING AND REPRODUCING INFORMATION WITH RESPECT TO A FLEXIBLE RECORDING MEDIUM

Keith Green, Kinross, and Alastair Lawson, Glenrothes, both of Scotland, assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 20, 1976, Ser. No. 704,902
Int. Cl.[2] G11B 5/48, 21/08, 15/60
U.S. Cl. 360—99 8 Claims

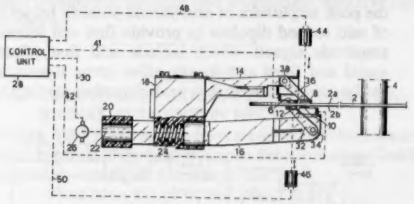
1. Apparatus for recording and reproducing information with respect to opposite surfaces of a flexible recording medium, comprising:

A. first and second aligned cantilever arms spaced from each other for receiving the flexible recording medium therebetween;

B. the first of said aligned cantilever arms including a transducer head and a pressure pad both cooperable with one surface of the flexible recording medium, the second aligned cantilever arm including a transducer head and pressure pad cooperable with the other surface of the flexible recording medium, each transducer head fixedly mounted to the arm and each pressure pad pivotally mounted to the arm, the transducer head of the first arm

being carried at the end of the arm with the pressure pad of the first arm being carried inwardly of the end, the transducer head of the second arm being carried inwardly of the end of the arm and the pressure pad of the second arm being carried at the end of the arm, where the pressure pad of each arm on one side of the disk is aligned with the transducer head of the other arm on the other side of the disk;

C. selection control means for selecting the transducer head to be operative for recording and reproducing information



with respect to its respective surface of the flexible recording medium;

D. said selection control means including actuating means for selectively pivoting each pressure pad to cause said pressure pad to press the opposite surface of the flexible recording medium against the aligned transducer head cooperable with the opposite surface of the flexible recording medium; and

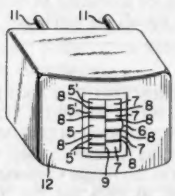
E. mounting means for holding said first and second aligned cantilever arms in operative proximity to the flexible recording medium.

4,085,429

MAGNETIC HEAD HAVING OPTIMUM SPACER THICKNESS DISPOSED BETWEEN DUMMY AND WRITE-IN CORE SEGMENTS

Tachio Hasegawa, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Jun. 3, 1976, Ser. No. 692,332
Claims priority, application Japan, Jun. 13, 1975, 50-71677
Int. Cl.² G11B *5/25, 5/22, 5/27*
U.S. Cl. 360—119 **3 Claims**



1. A magnetic head comprising:

a write-in excitation core;

a write-in coil wound around said write-in excitation core;

a read-out excitation core having narrower track width than that of said write-in excitation core for forming a closed magnetic loop circuit with a gap interposed between said read-out excitation core and said write-in excitation core;

a read-out coil wound around said read-out excitation core;

a non-magnetic spacer having thickness 1.5 to 5 times as great as the width of said gap and disposed at at least one end of said read-out excitation core with respect to the width direction of the track of said read-out excitation core; and

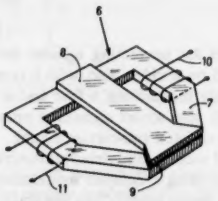
a dummy core disposed adjacent to said read-out excitation core with said non-magnetic spacer interposed therebetween for forming a closed magnetic loop circuit with a dummy gap interposed between said dummy core and said write-in excitation core, the dummy gap having the same width as said first mentioned gap, said dummy core comprising a plurality of divided dummy core segments, and additional non-magnetic spacers each of which has thickness 1.5 to 5 times as great as the width of said first mentioned gap and interposed among respective ones of said dummy core segments.

4,085,430

THIN FILM MAGNETIC HEAD WITH A GAP FORMED BETWEEN A LOOP SHAPED CORE PART AND A BRIDGING CORE PART

Jan T. Gerkema, and Frederik Willem Gorter, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 530,277, Dec. 6, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,408
Claims priority, application Netherlands, Jan. 24, 1974, 7400955
Int. Cl.² G11B *5/25, 5/27*
U.S. Cl. 360—119 **9 Claims**



1. A thin-film magnetic head comprising a first loop shaped core part of magnetizable material having an upper surface with an outer edge, a second core part of magnetizable material having a lower surface and an outer edge and extending from one side of the upper surfaces of the first core part across the upper surface of the first core part to an opposite side of the first core part and overlapping an area of the upper surface of said opposite side of said first core part with a lower surface of said second core part, said second core part being magnetically coupled to said first core part at said one side of said first core part and providing an elongated surface parallel with the upper surface of the first core part and having an elongated outer edge on said elongated surface parallel to said outer edge of said first core part, and a layer of non-magnetizable material between the first and second core parts in the overlapping area thereof, the outer edges of said first and said second core parts forming therebetween a gap elongated in a direction perpendicular to the direction in which the second core part extends across the first core part.

4,085,431

LIMITER CIRCUIT

Masahiro Chikatsu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 586,600, Jun. 13, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 741,122
Claims priority, application Japan, Jun. 20, 1974, 49-72183[U]
Int. Cl.² H03G *3/30*
U.S. Cl. 361—56 **9 Claims**

1. A limiter circuit adapted to be connected between a level regulator and a recording equalizer comprising:

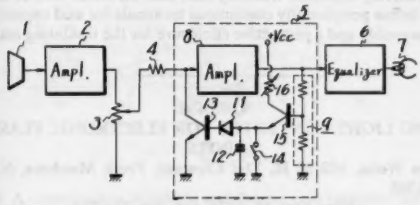
a. a recording amplifier having an input and an output;

b. a signal limiting means operative for limiting a signal applied to the input of said amplifier from the level regulator;

c. signal charging and discharging means comprising a capacitor connected to said signal limiting means for controlling operation of the latter in response to the charging of said signal charging and discharging means;

d. a high impedance voltage divider connected to the output of said recording amplifier to derive a signal therefrom without affecting the output signal of said recording amplifier;

e. an emitter-follower transistor for level detecting the output of said recording amplifier and feeding a signal to said signal charging and discharging means for charging the latter when the signal level detected by said transistor



exceeds a predetermined level, the base electrode of said transistor being connected to said voltage divider and comprising a high impedance input circuit for said emitter-follower transistor, and an emitter electrode thereof being connected to said signal charging and discharging means and comprising a low impedance charging circuit for said means; and

f. a variable resistor connected in series with the emitter-collector circuit of said emitter-follower transistor and said signal charging and discharging means to control the charging time of said signal charging and discharging means.

4,085,432

VOLTAGE LIMITER CIRCUIT

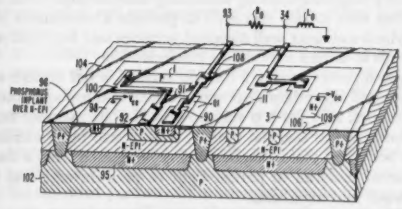
Leroy Wilfred Varettoni, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1977, Ser. No. 795,141

Claims priority, application United Kingdom, May 21, 1976, 21165/76

Int. Cl.² H02H *3/20*

U.S. Cl. 361—91 **4 Claims**



1. In a circuit which includes a node, a plurality of current paths connected in parallel between said node and a point of reference potential, at least some of said paths each including at least one semiconductor junction poled in the same sense relative to said node, and in which there is produced at said node a voltage which may, at times, be in the reverse direction relative to said junctions and which, if not limited, may reach a level such as to adversely affect the circuit operation by causing reverse breakdown of one or more of said junctions, the improvement comprising:

one of said paths exhibiting a substantially lower resistance than all of the others to a voltage at said node in said reverse direction which attempts to exceed a given value, said path including one of said semiconductor junctions which will tolerate reverse breakdown without adversely affecting circuit operation, that junction having a substantially lower reverse breakdown voltage than the junctions in said other paths, whereby any tendency of said reverse voltage at said node to increase beyond said given value results in non-destructive current flow in the reverse direction through said junction to thereby limit the voltage at said node;

an inductor connected between said node and said point of reference potential; and

said one junction comprising the base-to-collector electrode junction of a transistor which has also a base-to-emitter electrode junction, said transistor being connected to said node at said emitter electrode.

4,085,433

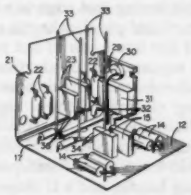
METHOD AND APPARATUS FOR IMPROVING PACKAGING DENSITY OF DISCRETE ELECTRONIC COMPONENTS

Conrad J. Baranowski, 27 Elmore St., Arlington Heights, Mass. 02174

Filed Nov. 22, 1976, Ser. No. 744,136

Int. Cl.² H05K *1/04*

U.S. Cl. 361—396 **4 Claims**



1. A method for increasing packaging density of discrete electronic components mounted to a flexible printed circuit board, said method comprising the steps of:

laying out the printed circuit pattern and component and terminal locations on said flexible board, on first and second spaced portions thereof and on a central portion by which the spaced portions are separated, to facilitate folding said flexible board along a fold line common to the first portion and the central portion and along another fold line common to the second portion and the central portion and to prevent interference between components when said flexible board is folded along the fold lines with the spaced portions in confronting relationship;

positioning components and terminals at the laid-out locations on the spaced and central portions on one side of said flexible board with the components in orientations generally parallel with the surface of the board;

soldering the leads of the components and terminals on the side of the board opposite to the components to secure the components and terminals physically to the board and make electrical interconnections between the printed circuit pattern and the components and terminals; and

folding said flexible board along the fold lines so that said first and second portions of said board are substantially parallel and relatively close together in face-to-face relationship substantially perpendicular to and separated by the width of the central portion, at least some of said components and terminals on said first and second and central portions being in mutual interleaving relationship.

4,085,434

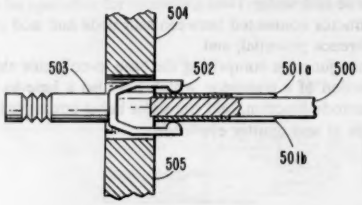
TRAFFIC CONTROL SYSTEM

Carlile R. Stevens, 1000 Ironwood Pl., Alamo, Calif. 94507

Continuation of Ser. No. 302,041, Oct. 30, 1972, abandoned, which is a continuation of Ser. No. 5,068, Jan. 22, 1970. This application Dec. 26, 1974, Ser. No. 536,465

Int. Cl.[2] H02B *1/02*

U.S. Cl. 361—413 **9 Claims**



1. Apparatus for enabling an operator to selectively program an automatic traffic controller to determine traffic flow on a road, comprising:

a. a panel having a plurality of elongated slots therethrough and traffic control information indicia associated with each slot on a front side of said panel:

a plurality of printed circuit boards, each board of a given thickness having two conductive strips separated by said board thickness mounted on a respective side of said board and extending to a common edge of said board, each of said boards extending transversely to one of said elongated slots and having said edge in a butting relationship to a rear side of said panel, wherein said board thickness separates said slot into a pair of slot portions so that each slot portion exposes one conductive strip of said two strips, and wherein each circuit board includes circuitry for processing electrical control signals in accordance with said indicia; and

c. a programming pin releasably insertable in any one of said slots from said front side of said panel and including a finger gripping handle, and a U shaped resilient conducting member connected to said handle and being of a size and shape to slide over said two conductive strips separated by said board thickness to interconnect said strips electrically.

4,085,435

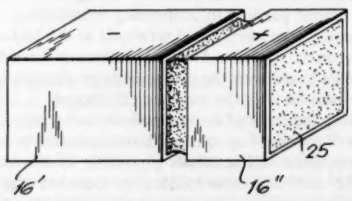
TANTALUM CHIP CAPACITOR

John L. Galvagni, Little Genesee, N.Y., assignor to AVX Corporation, Great Neck, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,596

Int. Cl.[2] H01G *9/00*

U.S. Cl. 361—433 **2 Claims**



1. A capacitor device comprising, in combination, a solid electrolyte chip capacitor subassembly having an outer cathode end portion, an anode body projecting axially from the cathode end portion, and an anode lead extending axially from said anode body, a tubular metallic case formed by axially spaced sleeve members completely enclosing said cathode end portion and anode body of the subassembly, a first electrical connection between said cathode end portion of said subassembly and one of the sleeve members of said case adjacent one axial end of the subassembly, a second electrical connection completely enclosed by said case between said anode lead and the other sleeve member of said case adjacent the other axial end of the subassembly, a unitary mass of hardened polymeric insulating material encapsulating the subassembly and adhesively bonded internally to said case extending over a central zone between said axial ends, said sleeve members being axially spaced along the anode lead to form a continuous peripheral gap, which is substantially smaller in axial extent than said case and through which the insulating material in the central zone is restrictively exposed, whereby said case on either side of said gap define peripherally continuous terminals for said capacitor subassembly and a protective enclosure for the insulating material.

4,085,436

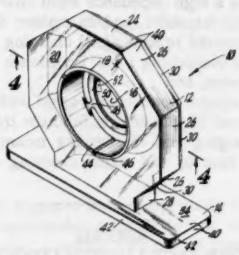
RING LIGHT CONVERTER FOR ELECTRONIC FLASH UNITS

Allen Weiss, 188-25 H, 71st Crescent, Fresh Meadows, N.Y. 11365

Filed Oct. 14, 1976, Ser. No. 732,220

Int. Cl.[2] G03B *15/02*; F21V *7/04*

U.S. Cl. 362—16 **8 Claims**



1. An attachment to an electronic flash unit for converting the unit into a photographic ring light for use with a camera, said attachment comprising:

a body member having a flat front wall, a rear wall, a top wall, side walls and a flat bottom wall, said flat bottom wall being disposed in a perpendicular relationship with said flat front wall, said body member including a centrally disposed opening extending therethrough from said front wall to said rear wall to provide a continuous 360° cylindrical inner wall disposed between said front and rear walls to define a torus-like configuration;

a plate member having a flat top surface, a flat bottom surface and side edges disposed between said top and bottom surfaces, said flat top surface of said plate member being connected to said flat bottom wall of said body member;

said body and plate members being fabricated from a transparent material to permit light to pass through and between said members;

reflective means disposed against and covering said rear, top, side and inner walls of said body member and covering unconnected portions of said top surface and side edges of said plate member for directing light through said attachment from said bottom surface of said plate member to said front wall of said body member in a perpendicular path, said bottom surface and front wall being uncovered by said reflective means

said rear wall of said body member including beveled surfaces to provide a trough-like arrangement for distributing the light around said body member and directing the light outwardly from said front wall of said body member completely around said opening to obtain a uniform illumination from said body member;

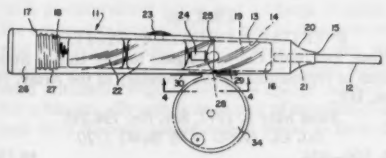
whereby said attachment is adapted for mounting a camera lens in coaxial alignment with said opening and also is adapted for mounting a light-emitting portion of the electronic flash unit against said uncovered bottom surface of said plate member.

4,085,437

LIGHTED FISHING POLE

Theodore Frederick Hrdlicka, and Floyd Stafford, both of 143 S. Windsor Dr., Denver, Colo. 80219

Filed Jul. 19, 1976, Ser. No. 706,833
Int. Cl.[2] F21V *33/00*
U.S. Cl. 362—109 **1 Claim**



1. A combination flashlight and fishing pole intended for use by fishermen and the like to provide selective illumination during evening hours, the device comprising, in combination:

an elongated tubularly shaped rod manufactured of flexible material and having a front end and a back end;

an axially elongated cylindrical handle member of a diameter greater than the rod, the handle member having a cylindrical outer surface, a flat back end surface, and a conically outwardly tapered front end surface of a truncated configuration;

the handle member being manufactured of a durable transparent plastic material permitting illumination to pass freely therethrough;

an axially elongated cylindrical opening disposed in the handle member front end surface along the axis thereof, the opening extending inwardly of the handle member from the truncated portion of the front end surface, the opening being of a diameter to snugly receive the back end portion of the rod therein with the rod being readily detached from the handle member;

an axially elongated cylindrically shaped compartment formed integrally in the handle member rearward of the front end surface and opening out of the back end surface, the compartment having a front end, an open back end, and interior cylindrical wall surfaces;

a series of screw threads formed integrally with the compartment wall surfaces immediately adjacent the compartment back end and extending inwardly of the compartment;

a cylindrically shaped cap member having a cylindrical head portion of the same exterior diameter as the handle member at its back end surface, and a body portion of a reduced diameter extending axially from the head portion and adapted to be received in the compartment, screw threads being formed integrally with the cylindrical outer surface of the body portion to be threadedly received in the threaded portion of the compartment to form a watertight seal therewith upon the cap member being threaded onto the handle member to close the compartment;

a lens member disposed in the compartment perpendicular to the axis thereof and spaced rearwardly of the compartment front end;

a low voltage electrical bulb associated with the lens member and mounted in the compartment in a manner to project light forwardly of the compartment when energized;

an electrical storage type battery mounted in the compartment for selectively energizing the bulb;

an electrical switch mounted in the compartment and having a portion thereof projecting outwardly of the interior wall surface and exteriorly of the handle member for selective movement between an "on" and "off" position for selectively energizing and de-energizing the bulb to control the illumination projected thereby;

an elongated rectangular slot formed in the exterior surface of the handle member and extending longitudinally therealong, the slot having a leading edge and a trailing edge and opposed side edges;

an elongated rectangular groove formed immediately beneath the exterior surface of the handle member having one end contiguous with the leading edge of the slot, the groove extending longitudinally therefrom;

a longitudinally elongated rectangular bracket of a cross-section configuration having a curvature matching the curvature of the handle member, the bracket being of a width approximating the width of the slot, the bracket having a leading edge and a trailing edge, a raised flange formed integrally with the trailing edge, and an axially extending slot formed in the bracket intermediate the leading and trailing edges;

a fixed pin mounted to the handle member adjacent the slot trailing edge and along the axis thereof, the pin projecting outwardly of the handle member to be slidably received in the bracket slot for guiding the sliding movement of the bracket relative to the handle member from an operative position over a portion of the slot to an inoperative position free of the slot and overlying the handle member;

the slot, groove, and bracket cooperating with each other in a manner to readily attach and detach a conventional type fishing reel to the handle member;

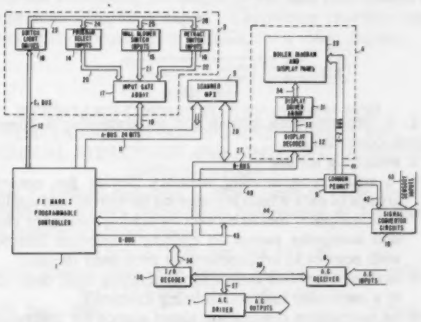
whereby the handle member provides a selectively controlled flashlight illumination means with the detachable pole affixed therein for fishing while performing fishing activities, and with the handle member being usable as a conventional flashlight with the detachable rod removed therefrom.

4,085,433

DIGITAL SOOTBLOWER CONTROL SYSTEMS AND METHODS THEREFOR

Robert Gerald Butler, Erie, Pa., assignor to Copes-Vulcan Inc., Lake City, Pa.

Filed Nov. 11, 1976, Ser. No. 741,136
Int. Cl.[2] G06F *15/46*; F23J *1/00*
U.S. Cl. 364—107 **110 Claims**



1. A digital sootblower control system comprising:

controller means for receiving information inputs representative of sootblowers to be activated and sootblower operational status, said controller means operating according to a fixed program to process information inputs supplied thereto and issue coded start commands, when appropriate, to selected sootblowers within the system;

sootblower control means for decoding start commands issued by said controller means and initiating operation of selected sootblowers in response thereto, said sootblower control means additionally acting to receive information

representative of the operating status of each sootblower within the system;

display means for receiving information representative of the operating status of each sootblower in the system from said sootblower control means as well as sootblower and system operational status information, and for providing a visual display thereof;

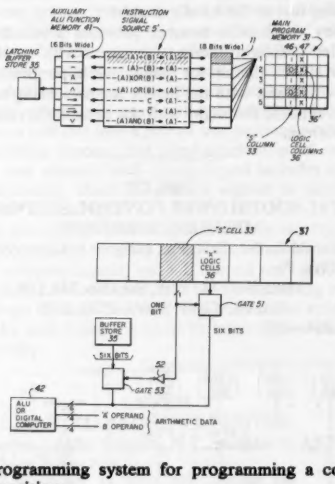
multi-conductor bus means interconnecting said controller means, said sootblower control means and said display means in an operational configuration; and

information input means interconnected to said controller means for designating sootblowers to be activated and certain sootblower operational status conditions, said information input means supplying information inputs representative of sootblowers to be activated and said certain sootblower operational status to said controller means.

4,085,439
COMPUTER PROGRAMMING SYSTEM HAVING GREATLY REDUCED STORAGE CAPACITY AND HIGH SPEED

William A. Minnick, Cupertino, Calif., assignor to Itek Corporation, Lexington, Va.

Filed Aug. 27, 1976, Ser. No. 718,299
Int. Cl.[2] G06F 9/00
U.S. Cl. 364—200 **12 Claims**



1. A programming system for programming a computer means comprising:

a. switching means;

b. a main programming memory device for containing groups of data which are readout therefrom and applied to said computer means by said switching means for causing said computer means to execute a selected instruction with respect to arithmetic data processed therein;

c. auxiliary function means for generating logic data unique to a particular instruction being executed;

d. an instruction designation signal source for designating a particular instruction to be applied to said computer means;

e. coupling means coupled between said instruction designation signal source and said auxiliary function means for controlling the generation of said unique logic data by said auxiliary function means in accordance with the designation of a selected instruction by said signal source;

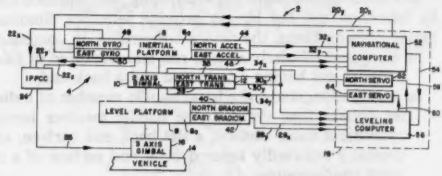
f. data source selection means, associated with logic data cells within said main programming memory, for producing a first signal upon readout when logic data within associated logic data cells is not unique to a particular instruction being executed and for producing a second signal upon readout when logic data within associated logic data cells is unique to a particular instruction being executed; and

g. switch control means, coupled to said switching means, for causing logic data within said main programming memory to be transmitted by said switching means to said computer means when said data source selection means produces said first signal upon readout, and for causing said logic data generated by said auxiliary function means to be transmitted to said computer means by said switching means rather than data from said main programming memory, when said source selection means produces said second signal upon readout.

4,085,440
INERTIAL NAVIGATION SYSTEM

Eddy Hose, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1977, Ser. No. 794,195
Int. Cl.[2] G06G 7/78; B64G 1/20
U.S. Cl. 364—454 **10 Claims**



1. A navigational system comprising:

a platform assembly comprising an inertial platform unit which includes an inertial platform, a level platform unit which comprises a level platform, said inertial platform and said level platform being connected to a two axis gimbal, said inertial platform being rotatable relative to said level platform, and means connected to said two axis gimbal for sensing said rotation,

a three axis gimbal connected to said platform assembly for referencing said inertial platform in response to first corrected signals and for connecting said assembly to a vehicle,

an inertial platform position control computer for generating said first corrected signals to said three axis gimbal, in response to first output signals generated from a control means to said inertial platform unit and first positioning signals received from said inertial platform unit, for referencing said inertial platform to a datum reference spheroid, and,

a control means for generating said first output signals, and for generating second corrected signals to said two axis gimbal in response to second positioning signals received from said level platform unit, second output signals received from said sensing means, and third output signals received from said inertial platform unit, for aligning said level platform with the true vertical to the geopotential surface of the earth.

4,085,441
MONOLITHIC IMPLEMENTATION OF A FAST FOURIER TRANSFORM

John L. Fagan, Pasadena, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1976, Ser. No. 744,546
Int. Cl.[2] G11C 11/40; H03K 5/159
U.S. Cl. 364—827 **16 Claims**

1. Apparatus for realizing a fast Fourier transform of an analog input signal represented by

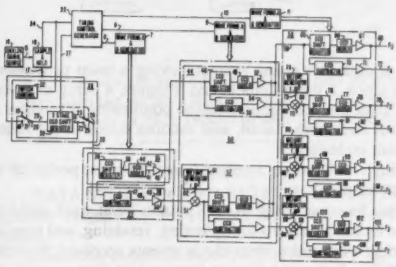
a plurality of time spaced discrete analog data signals each having a single value comprising:

means for reordering said discrete analog data signals to provide a sequence of predetermined pairs of said discrete analog data signals,

a first arithmetic stage including a charge coupled device for arithmetically combining said pairs of said discrete analog data signals to form a first and second discrete analog output signal,

a second arithmetic stage including a charge coupled device for arithmetically combining a pair of successive values of said first discrete analog output signal to form a third and fourth discrete analog output signal, means for weighting said second discrete analog output signal in accordance with predetermined values and a charge coupled device for arithmetically combining a pair of succesive values of said weighted second discrete analog output signal to form a fifth and sixth discrete analog output signal, and

a third arithmetic stage including a charge coupled device for arithmetically combining a pair of successive values of said third discrete analog output signal to form the seventh and eighth discrete analog output signal, means for weighting said fourth discrete analog output signal in accordance with predetermined values and a charge coupled device for arithmetically combining a pair of successive values of said weighted fourth discrete analog output signal to form the ninth and tenth discrete analog output signal,



means for weighting said fifth discrete analog output signal in accordance with predetermined values and a charge coupled device for arithmetically combining a pair of successive values of said weighted fifth discrete analog output signal to form the eleventh and twelfth discrete analog output signal, and

means for weighting said sixth discrete analog output signal in accordance with predetermined values and a charge coupled device for arithmetically combining a pair of successive values of said weighted sixth discrete analog output signal to form the thirteenth and fourteenth discrete analog output signal,

said seventh through fourteenth discrete analog output signals having values indicative of the Fourier coefficients of the fast Fourier transform of said analog input signal.

4,085,442

DATA DISPLAY SYSTEM DESIGNED AS A MICROCONTROLLER

Sigitas Julius Liaukus, Huntington, and Dixson Teh-Chao Jen, Monroe, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 31, 1975, Ser. No. 563,527
Int. Cl.² G06F 3/14
U.S. Cl. 364—900 **18 Claims**

1. A data display system comprising:

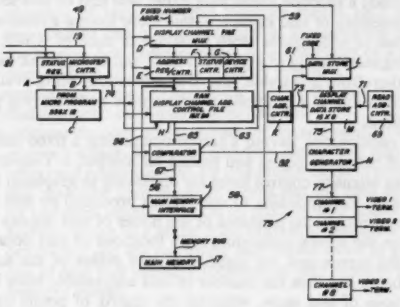
(a) a programmable read-out memory (PROM) for storing a fixed microroutine for governing logic operation of the system;

(b) first control means enabled by the PROM during an initial subroutine (status), for transferring a fixed number address into an address register;

(c) a memory interface means for communicating with a main memory;

(d) means connecting an address register output to the interface means for reading, from a main memory, the contents of the fixed number address, the contents being a character data starting address;

(e) means connecting the output of the interface means to the first control means, for transferring the starting address and an incremented status, through the address register and a status counter, to an address control file means, for storing the starting address and the incremented status therein;



(f) means for transferring the stored incremented status from the file means to a status register;

(g) means connecting the status register to the PROM for the addressing thereof;

(h) the first control means being responsive to the PROM for transferring therethrough, the stored starting address from the address control file to the address register;

(i) second control means responsive to the PROM for transferring character data, from the starting address in the main memory, through the interface means, to display data store means, after the completion of transferral in (h);

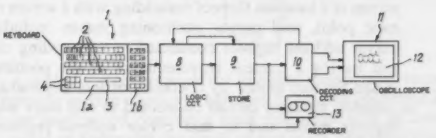
(j) means connecting the output of the data store means to character generating means for providing character data information, channel by channel, for a video display.

4,085,443

KEYBOARD OPERATED APPARATUS FOR SIMULTANEOUS CODING AND DISPLAY OF CHEMICAL STRUCTURE AND SIMILAR GRAPHICAL INFORMATION

Jacques E. Dubois, and John A. Miller, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Sep. 8, 1975, Ser. No. 611,197
Claims priority, application France, Sep. 16, 1974, 74 31244
Int. Cl.² G06F 3/14, 3/06, 3/02
U.S. Cl. 364—900 **7 Claims**



1. An apparatus for the simultaneous coding and display of structural chemical formulae and other graphical information composed of nodes or ring positions and links or bonds between these nodes, in which a node is identifiable by at least

one alphanumeric character and a link is identifiable by graphical marking indicative of its nature and its direction, said apparatus comprising:

a keyboard including a first assembly of keys corresponding to different displayable alphanumeric characters, a second assembly of keys corresponding to displayable graphical marking indicative of a link and a third assembly of keys corresponding to different control functions for the apparatus;

a coding circuit for producing, in response to key actuation, signals of distinctive codes representative of the identity of the actuated key including as a part of each node a subcode identifying the one of said assemblies of which an actuated key is a member;

a store connected to said coding circuit for storing the signals produced by said coding circuit whenever they include a subcode identifying either said first or said second assembly of said keyboard, said store having a fixed number of addressable store locations in each of which said signals relating to a different node and to each link issuing therefrom is storable, one of said locations being available for each of a multiplicity of possible node or ring positions;

an oscilloscope having a screen comprising a fixed number of reference points and having an X-input, a Y-input and an intensity control input for displaying in graphical form data corresponding to said signals produced by said coding circuit, the positions of the nodes of said display data on the screen coinciding with locations of said points of the screen and the number of said points of the screen being less than the number of said addressable store locations of said store, whereby the matrix of points on the screen constitutes an image of a part of the matrix of store locations;

store address register means for cyclically addressing any collection of said store locations which can simultaneously correspond to the points on said screen of said oscilloscope and having an output connected to said store;

a scanning circuit connected to said store address register means for sequentially and cyclically varying the content thereof in such a way as to scan continuously the particular collection of store locations corresponding to said points on said screen at the time of scanning;

decoding means connected to said store for successively decoding the signals stored in said scanned store locations, said decoding means comprising an alphanumeric character generator and a graphical link generator connected to said inputs of said oscilloscope for producing a graphical display on the screen of said oscilloscope corresponding to the signals produced by said coding circuit in response to actuation of said keyboard;

shift control means connected to said store address register means and operable from said keyboard through said coding circuit for shifting the whole of the points on the screen relative to a corresponding array of the whole of the addressable store locations of said store, so as to change the collection of said addressable store locations which corresponds to the points on the screen;

means for generating an index cursor visible on said screen by affecting said intensity input of said oscilloscope;

means operable from said keyboard through said coding circuit for selectively positioning said cursor on said screen at a location thereof coinciding with a screen reference point, said cursor positioning means including a cursor address register connected to said coding circuit and having a content representative of the position selected for said cursor by operation of said keyboard, and

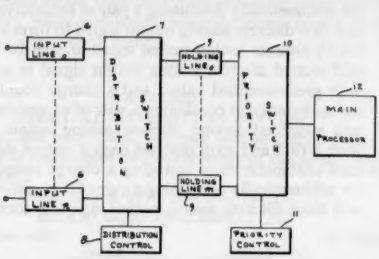
an equality detector circuit connected to said store address register means and to said cursor address register for providing a storing authorization signal for selecting, for storage of signals from said coding circuit, the one of said addressable store locations in said store which corresponds to that of the cursor on the screen and for providing a command signal to said cursor generating means.

4,085,444

RANDOM ACTION EVENT SWITCHING METHOD AND APPARATUS FOR A MULTIPLE INPUT DATA PROCESSING SYSTEM

Josef F. Schneider, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1976, Ser. No. 679,253
Int. Cl.[2] G06F *7/00, 3/00;* G11B *13/00*
U.S. Cl. 364—900 **5 Claims**



1. In a data processing system having a main processor, a systems clock, a timing clock, and *n* inputs, *n* being an integer greater than one, the improvement comprising a random action event switching circuit, said random action event switching circuit including

a timing clock having a period longer than the period of said systems clock,

an input line connected to each system input, each said input line including means for detecting, retaining, and synchronizing with said system clock, events received thereon,

m holding lines, *m* being an integer less than *n*, each said holding line having means for retaining the identity of the events accumulated on said input lines during one timing clock period,

a logic circuit for providing access to an available holding line and, at the end of each time clock period for clearing the input lines and switching the events accumulated thereon to said available holding line, and

a priority selector circuit for switching to said main processor for read-out the holding line next in line according to the priority of arrival of its retained events, said priority selection circuit being responsive to availability condition signals from said main processor.

4,085,445

TEXT MERGE WITH COPIES AND ENVELOPES

Margaret Mary Blevins, Lexington, Ky., and Robert Glenn Bluethman, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,818
Int. Cl.[2] G06F *3/12, 7/22*
U.S. Cl. 364—900 **8 Claims**

1. A printing system for interleaved, unattended printing of a plurality of personalized letters and envelopes, comprising:

memory means for storing codes corresponding to a single form letter and form envelope, said codes including constant text and control codes;

a plurality of records of codes of variable data, each record of variable data being stored on a storage means and each record including a plurality of fields;

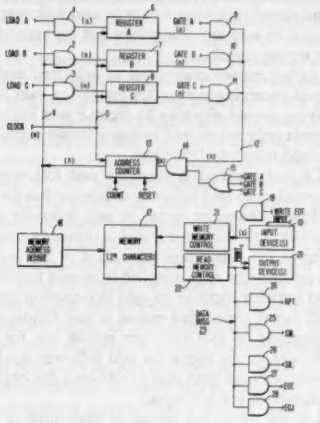
variable data input means for writing blocks of codes of variable data of one of said records into a portion of said memory means;

a printer;

means for repetitively outputting the contents of said memory to said printer to print said personalized letters and envelopes, including;

means responsive to said control codes in said form letter to

merge the variable data contained in a first group of chosen fields of each record into said constant text of said form letter; and



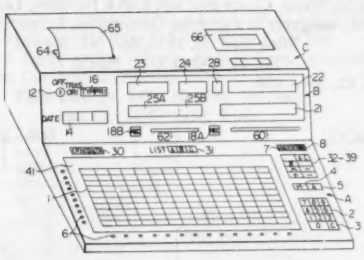
means responsive to said control codes in said form envelope to include the variable data contained in a second group of chosen fields of each record in said form envelope.

4,085,446

DATA STORAGE AND RETRIEVAL SYSTEM

Fumitaka Nagamura, 1-6-14 Tomigaya, Shibuya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 582,193, May 30, 1975, abandoned. This application Aug. 17, 1976, Ser. No. 715,195
Claims priority, application Japan, Jun. 1, 1974, 49-62142
Int. Cl.[2] G06F *15/40, 7/10, 3/02, 13/06*
U.S. Cl. 364—900 **3 Claims**



1. A data storage and retrieval system comprising:

a mass memory means for storing data at locations having plural digit addresses;

a random access memory means having a plurality of first memory locations for storing in each of said locations a coded word corresponding to one plural digit address of said mass memory means and a plurality of second memory locations each corresponding to one of said plurality of first memory locations for storing data;

a memory control means connected to said mass memory means and said random access memory means for reading the coded word stored in each of said first memory locations of said random access memory means and for storing in each of said second memory locations of said random access memory means the data stored in said mass memory means at the plural digit address which corresponds to said coded word stored in the respective first memory locations, and for storing in said mass memory means the data stored in each of said second memory locations of said random access memory means at the plural digit address of said mass memory means that corresponds to said coded word stored in the respective first memory locations;

a fixed display board having a plurality of display portions, each providing a selective indication by an indicator means;

a plurality of identification means having a plurality of identification portions corresponding to said plurality of display portions of said fixed display board for being mounted upon said fixed display board to identify each of said plurality of display positions;

an item selection means connected to said fixed display board for selecting one of a plurality of items each corresponding to one of said display positions identified by said identification means and for causing said corresponding indicator means to provide an indication of the selection;

a plurality of magnetic card memory means each corresponding to one of said plurality of identification means for storing data corresponding to at least part of a plural digit address of said mass memory means;

a magnetic card reading means for reading the data stored on said magnetic card memory means; and

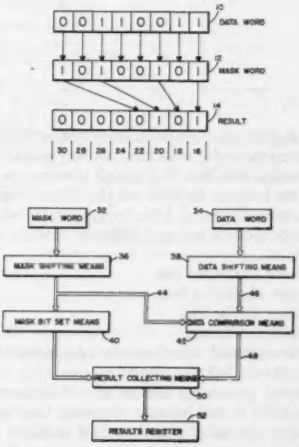
an address decoder means connected to said random access memory means, said item selection means and said magnetic card reading means for combining the data stored on said magnetic card memory means and the item selected by said item selection means to produce said coded word corresponding to a plural digit address of said mass memory means and for recording said coded word in at least one of said first memory locations of said random access memory means.

4,085,447

RIGHT JUSTIFIED MASK TRANSFER APPARATUS

Jerry Hudson Pertl, Bloomington, and Glen Roy Kregness, Hopkins, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 7, 1976, Ser. No. 720,930
Int. Cl.[2] G06F *7/02*
U.S. Cl. 364—900 **8 Claims**



1. A digital logical network for implementing a mask transfer function so that a series of noncontiguous bits contained in an n-bit mask word controls a mask operation with an n-bit data word and arranges the result of said mask operation contiguously in a result register, comprising:

a. mask shifting means selectively coupled to receive said mask word and having a mask shift output, said mask shift output adapted to produce signals representing an m-bit

contiguous portion of all of said bits of said mask word and including means for sequentially changing said mask shift output from said portion of bits in said mask word to the next contiguous portion of bits of said mask word;

b. mask bit set means selectively coupled to said mask shift output for determining the number of bits which are of a predetermined binary significance in said mask shift output;

c. data shifting means selectively coupled to said data word and having a data shift output, said data shift output being an m-bit contiguous portion of all of said bits of said data word and including means for sequentially changing said data shift output from said portion of bits in said data word to the next m-bit contiguous portion of bits of said data word;

d. data comparison means, selectively coupled to said data shift output and controlled by said mask shift output for iteratively performing a bit-by-bit comparison between said mask shift output and said data shift output and for shifting the results of said comparison only for bit positions of said predetermined binary significance in said mask shift output to contiguous bit positions; and

e. result collecting means, selectively coupled to said data comparison means and said result register and responsive to said mask bit set means, for iteratively collecting the successive results of said data comparison means so that successive results are kept in contiguous order throughout successive changes in said mask shifting means and said data shifting means.

4,085,448

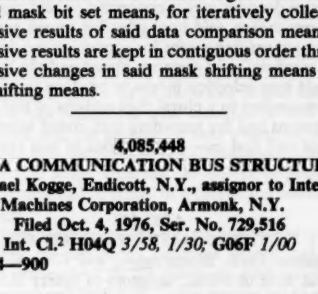
DATA COMMUNICATION BUS STRUCTURE

Peter Michael Kogge, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,516

Int. Cl.[2] H04Q *3/58, 1/30;* G06F *1/00*

U.S. Cl. 364—900 **3 Claims**



1. In a digital data communication system having at least one initiator module and at least one follower module connected by an information data bus over which information is transmitted between the initiator module and the follower module, control signal transfer means for transferring control signals between said initiator module and said follower module, comprising, in combination,

an initiator character bus,

a follower character bus,

an initiator strobe bus,

a follower strobe bus,

said character and stobe buses being connected to said initiator and said follower modules,

first signal generating means in said initiator module and connected to said initiator character bus for generating an initiator character signal on said initiator character bus, the initiator character signal comprising control signals to control the subsequent operation of the follower module on information data supplied from said initiator module to said follower module on said information data bus,

second signal generating means in said initiator module for generating an initiator strobe signal on said initiator strobe bus after a predetermined time delay following the beginning of said initiator character signal,

first signal receiving means in said follower module connected to said initiator character bus for receiving the initiator character signals and providing control signals to control the handling of information data received by said follower module from said data information bus,

second signal receiving means in said follower module connected to said initiator strobe bus for receiving the initiator strobe signals,

first gating means connected to said first and said second signal receiving means for rendering said first signal receiving means effective to receive said initiator character signals only when said initiator strobe signals are present on said initiator strobe bus,

third signal generating means in said follower module and connected to said follower character bus for generating a follower character signal on said follower character bus, the follower character signal comprising control signals to control the subsequent operation of the initiator module on information data supplied from said follower module to said initiator module on said information data bus,

fourth signal generating means in said follower module and connected to said follower strobe bus for generating a follower strobe signal on said follower strobe bus after a predetermined time delay following the beginning of said follower character signal,

third signal receiving means in said initiator module connected to said follower character bus for receiving the follower character signals and providing control signals to control the handling of information data received by said initiator module from said data information bus,

fourth signal receiving means in said initiator module connected to said follower strobe bus for receiving the follower strobe signals, and

second gating means connected to said third and said fourth signal receiving means for rending said third signal receiving means effective to receive said follower character signals only when said follower strobe signals are present on said follower strobe bus.

4,085,449

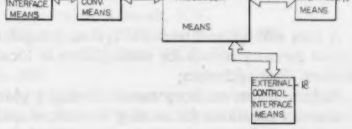
DIGITAL MODEM

Dale M. Walsh, Clearwater, and Karl I. Nordling, Largo, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Nov. 26, 1976, Ser. No. 744,994

Int. Cl.[2] H04J *3/12;* H04M *1/76*

U.S. Cl. 364—900 **9 Claims**



1. A digital modem for high-speed data transmission between data terminals communicating through amplitude limited signals over analog transmission facilities capable of digitally synthesizing modem function in real time; said digital modem comprising a processor control set, a memory/multiplier set, a signal processor set, and an interface means, said processor control set including a program address generator including circuitry to sequentially generate a predetermined plurality of program addresses, a program memory coupled to said program address generator including circuitry to receive said program addresses and generate a program instruction in response thereto and an instruction register coupled to said

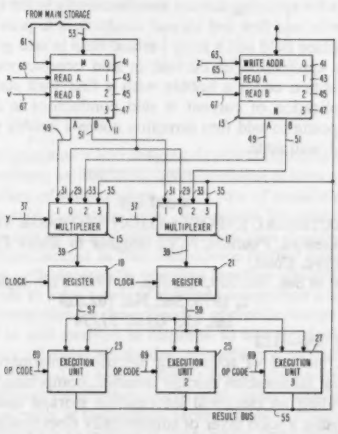
program memory including circuitry to receive said program instruction and generate an instruction signal in response thereto; said signal processor set comprising an arithmetic log unit coupled to said instruction register to receive said instruction signal, said signal processor set including circuitry to selectively respond to said instruction signals to perform one or a plurality of predetermined arithmetic operations and generate a processor set signal in response thereto, said memory/multiplier set comprising a high speed multiplier and a memory means including a data memory and coefficient memory being coupled between said processor control set and said high speed multiplier to receive said instruction signal, said data memory further coupled to said signal processor set to receive said processor set signals therefrom, said data memory and said coefficient memory each including circuitry to selectively generate data output signals and coefficient output signals in response to said instruction signal from said processor control set, said high speed multiplier including circuitry to receive said data output signals and said coefficient output signals and generate a product signal in response thereto, said interface means being coupled between the analog transmission facilities and said signal processor set and between said signal processor set and data terminal, said interface means including circuitry to receive analog input signals from a remote digital modem over analog transmission facilities and to convert said analog input signals to digital input signals fed to said signal processor set, said interface means further including circuitry to receive said processor set signal and convert said processor set signal to analog output signals for transmission over analog transmission facilities to a remote digital modem, said signal processor set further including circuitry to receive said digital input signals from said interface means and said product signal from memory/multiplier set for performing said arithmetic operations, said interface means further including circuitry to transfer information between interface input and the data terminals in said signal processor set, said signal processor set thus providing modulation, demodulation, filtering and equalization in real time.

4,085,450

PERFORMANCE INVARIENT EXECUTION UNIT FOR NON-COMMUNICATIVE INSTRUCTIONS

Bhalchandra Ramchandra Tulpule, Storrs, Conn., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 29, 1976, Ser. No. 755,360
Int. Cl.² G06F *7/38, 9/18*
U.S. Cl. 364—900 **5 Claims**



1. A performance invarient execution apparatus for non-communicative instructions comprising:

a first and a second addressable operand file, each having a first and a second output port;

a first multiplexer inputted by said first output ports of said first and second operand file;

a second multiplexer inputted by said second output ports of said first and said second operand file;

a first and a second working register inputted respectively by said first and said second multiplexer;

a plurality of execution units, each execution unit therein inputted by both said first and said second working register and each execution unit thereof having an operation code input for receiving an operation code specifying an operation to be executed;

a common bus for transferring outputs from said plurality of execution units to said second addressable operand file;

means for addressably writing from said common bus into said second addressable operand file;

first operand means for reading an operand into said first working register, said first operand means addressing in parallel said first and second addressable operand files for reading operands in parallel from said first ports thereof, and addressing said first multiplexer for selecting operand passage therethrough to said first working register; and

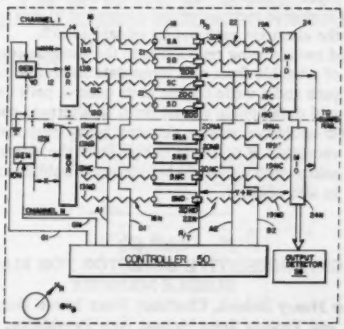
second operand means for reading an operand into said second working register, said second operand means addressing in parallel said first and said second addressable operand files for reading operands in parallel from said second ports thereof, and addressing said second multiplexer for selecting operand passage therethrough to said second working register.

4,085,451

BUBBLE DOMAIN CIRCUIT ORGANIZATION

Thomas T. Chen, and Isoris S. Gergis, both of Yorba Linda, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 14, 1977, Ser. No. 806,420
Int. Cl.² G11C *19/08*
U.S. Cl. 365—4 **6 Claims**



1. A device for magnetic bubble domains comprising:

a plurality of bubble domain generator means;

a plurality of replicator means for splitting bubble domains from an associated one of said generator means into a plurality of new domains;

propagation paths of different lengths interposed between each of said generator means and the associated replicator means;

storage means for storing said bubble domains;

input decoder means for selectively transferring said bubble domains from said replicator means to said storage register means;

detector means for detecting said domains having portions thereof at different distances from said storage means;

switch means associated with said storage means for selec-

tively transferring said domains between said storage means and said detector means; and

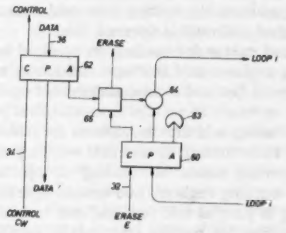
output decoder means for selectively transferring said domains to said detector means.

4,085,452

MAGNETIC DOMAIN MEMORY EMPLOYING ALL-BUBBLE LOGIC ELEMENTS

John Charles Linn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 13, 1974, Ser. No. 469,493
Int. Cl.² G11C *19/08*
U.S. Cl. 365—5 **12 Claims**



9. A magnetic memory, comprising:

a substrate,

a body of magnetic material capable of supporting magnetic domains secured adjacent one surface of said substrate, said magnetic domains being organized into a register,

means coupled to said body for generating and controllably positioning magnetic domains in said magnetic material in step fashion,

magnetic domain write means connected to said register for writing bubble data into said register from a common input data stream, said write means including

a transient bubble switch having its preferred path connected to said input data stream and its control path input connected to receive a write bubble, and

an exclusive merge element connected to said register into the alternate path output of said switch,

said switch being responsive to the simultaneous presence of a bubble from said input data stream in its preferred path and a write bubble in its control path for directing said data bubble to exit from its alternate path, and

said exclusive merge element being responsive to the reception of said data bubble from the alternate path of said switch to insert a bubble into a bubble void location in said register.

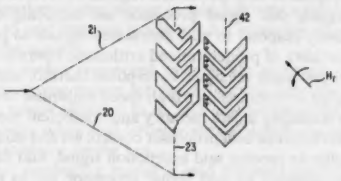
4,085,453

MAGNETORESISTIVE DETECTOR FOR MAGNETIC BUBBLE MEMORY

Andrew Henry Bobeck, Chatham; Peter Istvan Bonyhard, Edison, and Terence John Nelson, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1976, Ser. No. 739,472
Int. Cl.² G11C *19/08*
U.S. Cl. 365—8 **7 Claims**

1 A magnetic bubble memory including a layer of material in which magnetic bubbles can be moved and means for defining in said layer a path for the movement of bubbles to an expansion detector including a detector stage, said stage including a plurality of magnetic propagate elements aligned along an axis transverse to said path, adjacent pairs of said elements being linked by interlinking magnetic elements to form a series arrangement defining a bubble detector, each of said magnetic propagate elements including first and second contiguous side portions arranged at an angle to one another, each of said second side portions being bifurcated for defining first and second relatively narrow subportions, said second subportion of each one of said second side portions being coupled to the



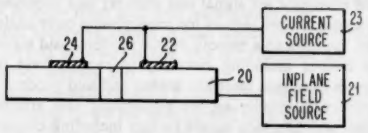
first subportion of the next consecutive one of said elements by one of said interlinking elements.

4,085,454

METHOD AND APPARATUS FOR THE CONTROLLED GENERATION OF WALL ENCODED MAGNETIC BUBBLE DOMAINS

David Malcolm Hannon, Palo Alto, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1977, Ser. No. 783,378
Int. Cl.² G11C *19/08*
U.S. Cl. 365—30 **8 Claims**



1. An apparatus for coding bubble wall states in a bubble medium comprising

a first conductor positioned on said bubble medium,

a second conductor positioned parallel to said first conductor to form a gap there-between, said gap being of sufficient size to provide a local in-plane field in said gap sufficient for coding bubble wall states and a local vertical field in said gap sufficient to retain a bubble in said gap during the application of current in said first and second conductors, the widthh of said gap being approximately 0.5 to 2 times the bubble diameter,

means for applying an external in-plane field to said bubble medium, and

means for applying current simultaneously in the same direction in said first and second conductors to provide a local in-plane field and a local vertical field in said gap wherein the application of current in said conductors in a first direction codes a bubble with a first wall state and the application of current in said conductors in a direction opposite to said first direction codes a bubble with a second wall state.

4,085,455

ELECTRICAL INFORMATION STORAGE SYSTEM

Koji Okumura, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

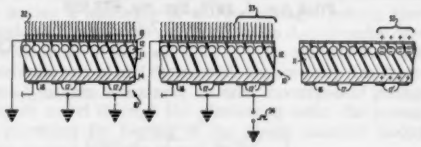
Division of Ser. No. 539,913, Jan. 9, 1975. This application Jul. 2, 1976, Ser. No. 702,329
Int. Cl.² G11C *11/34*
U.S. Cl. 365—112 **5 Claims**

2. A method of addressing electrical information into an electrical information storage member, comprising:

providing an electrical information storage member comprising a solid layer of substantially electrically insulating material containing a layer of particulate electrically photosensitive material, a semiconductor layer contacting one surface of said layer of substantially electrically insulating

material, and a substantially transparent electrode layer of electrically conductive material contacting the opposite surface of said layer of substantially electrically insulating material,

substantially uniformly exposing the entire layer of electrically photosensitive material with activating electromagnetic radiation, and



placing an electrical field across desired areas of said member by impinging an electron beam onto the surface of the semiconductor layer in desired areas, thereby addressing electrical information into said deisred areas of the member.

4,085,456

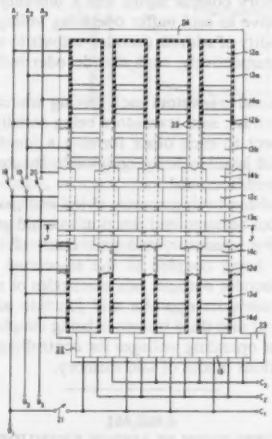
CHARGE TRANSFER IMAGING DEVICES

Michael Francis Tompsett, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 124,735, Mar. 16, 1971, abandoned. This application Aug. 30, 1972, Ser. No. 285,054

Int. Cl.² G11C *11/32, 13/04, 19/28*

U.S. Cl. 365—114 **19 Claims**



7. A charge transfer line imaging device comprising a charge storage medium, an insulating layer covering at least a portion of one surface of said medium, a first row of metal electrodes formed on said insulating layer, and means for projecting an image onto one surface of said medium to form charge carriers therein, characterized in that said device further comprises a conduction path electrically coupling together all electrodes of said first row to form a row of localized integration sites in said medium thereunder for the collection of mobile charge carriers generated in said medium in response to said incident light, a second array of metal electrodes, comprising a second row of electrodes, formed on said insulating layer over an area of the storage medium contiguous to the area under said first row, certain electrodes of said second array aligned in columns with said first row so as to receive in the medium thereunder charge carriers from a corresponding integration site, conduction paths for sequentially biasing the electrodes of said second row to transfer said charge carriers thereunder serially for detection, and means for shielding the surface of the storage medium under said second array from incident light.

4,085,457

MEMORY SYSTEM WITH A SENSE CIRCUIT

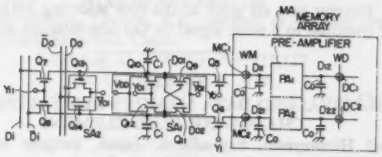
Kiyoo Itoh, Higashi-kurume, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 31, 1976, Ser. No. 672,154

Claims priority, application Japan, Mar. 31, 1975, 50-37985

Int. Cl.² G11C *7/06*

U.S. Cl. 365—205 **13 Claims**



1. A memory system comprising:

first and second data lines, to each of which a plurality of memory cells for storing information are connected;

third and fourth data lines;

first and second switching means for individually connecting said first and second data lines on a selective basis to said third and fourth data lines, respectively, in response to respective first and second address signals respectively applied to said first and second switching means; and

a sense amplifier comprised of a flip-flop circuit having first and second input nodes connected to said third and fourth data lines, respectively.

4,085,458

RANDOM ACCESS MEMORY

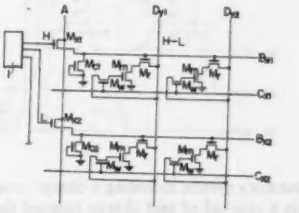
Kunihiko Ikuzaki, Hinodemachi; Tsuneo Ito, Kodaira; Masamichi Ishihara, Tachikawa, and Takashi Sato, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

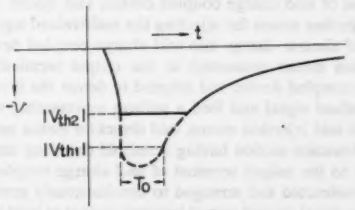
Filed May 26, 1976, Ser. No. 690,303

Claims priority, application Japan, Jun. 4, 1975, 50-66552

Int. Cl.² G11C *7/02*

U.S. Cl. 365—206 **2 Claims**





1. An n-channel random access memory comprising in a p-type semiconductor substrate:

a plurality of memory cells arranged in a matrix form, each of the memory cells including an information storing

MOSFET having a source connected to a reference potential, word lines being associated with respective rows of the matrix, the word line being adapted to receive a positive voltage signal relative to the reference potential;

row selecting MOSFET's connected to the word lines respectively; and

switching means including a plurality of clamping MOSFET's each connected between a respective word line and said reference potential for clamping the word line to a predetermined potential when the word line is not selected, said clamping MOSFET's having a lower threshold voltage than that of the row selecting MOSFET to thereby turn on prior to the row selecting MOSFET in response to a noise signal on the non-selected word line.

4,085,459

MULTIVALUED DATA MEMORY SYSTEM USING A CHARGE COUPLED ELEMENT

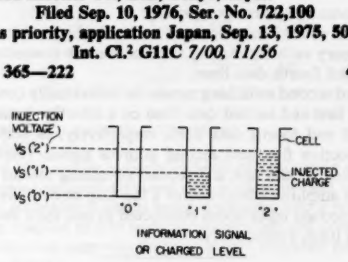
Kanji Hirabayashi, Sagamihara, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

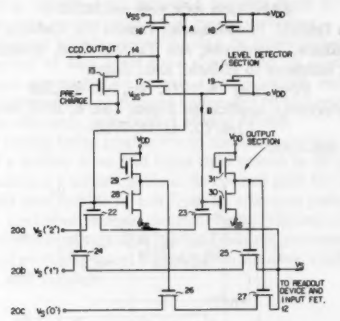
Filed Sep. 10, 1976, Ser. No. 722,100

Claims priority, application Japan, Sep. 13, 1975, 50-111213

Int. Cl.² G11C *7/00, 11/56*

U.S. Cl. 365—222 **4 Claims**





1. A memory system including a charge coupled device for storing in a channel of said charge coupled device an analog multivalued signal having at least three information carrying levels represented by an analog voltage level at the output terminal of said charge coupled device, said system comprising: injection means for injecting the multivalued signal in the form of electric charge into said charge coupled device; and detection means connected to the output terminal of said charge coupled device and adapted to detect the level of said multivalued signal and feed a voltage representing said level back to said injection means, said detection means including a level detection section having threshold detection means connected to the output terminal of said charge coupled device and constructed and arranged to simultaneously compare the voltage signal on said output terminal against at least two fixed voltage threshold levels and to generate a combination of binary outputs representing the multivalued signal level read out from the output terminal of said charge coupled device, and an output section for generating upon receipt of said combination of binary outputs an multivalued output having a voltage level corresponding to said combination of outputs.

4,085,460

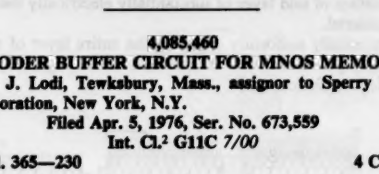
DECODER BUFFER CIRCUIT FOR MNOS MEMORY

Robert J. Lodi, Tewksbury, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,559

Int. Cl.² G11C *7/00*

U.S. Cl. 365—230 **4 Claims**



1. In a digital memory having an array of variable threshold transistor memory cells formed on a substrate, each said cell having gate electrode means, said cells being arranged in a plurality of word rows with the gate electrode means of each of said rows being coupled to one of a plurality of word lines respectively; address decoder means responsive to address signals and having a plurality of outputs for selectively energizing said outputs in accordance with said address signals; control circuitry responsive to memory control inputs for selectively providing buffer operating voltages in accordance with said memory control inputs and a plurality of decoder buffers responsive to said buffer operating voltages and coupling said plurality of address decoder outputs to said plurality of word lines respectively; each said decoder buffer comprising:

first and second transistors each having source, drain and gate electrodes, said transistors being serially connected with respect to each other forming a junction therebetween, said junction being coupled to the associated one of said word lines, and

a third transistor having source, drain and gate electrodes and coupled between said junction and said gate electrode of said first transistor, said gate electrode of said first transistor being coupled to the associated one of said address decoder outputs, said electrodes of said first and second transistors opposite said junction and said gate electrode of said third transistor being coupled to receive said buffer operating voltages for controlling said buffers in the various modes of said memory.

4,085,461

SCREW-TYPE PLASTICS EXTRUDER

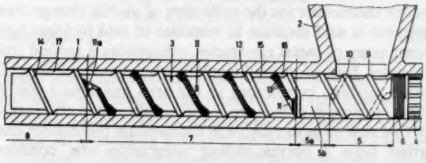
Charles E. Maillefer, Renens, Switzerland, assignor to Maillefer S.A., Switzerland

Filed Jun. 4, 1976, Ser. No. 692,751

Claims priority, application Switzerland, Jun. 30, 1975, 8486/75

Int. Cl.² B29F *3/02*

U.S. Cl. 366—90 **11 Claims**



1. In an extruder for plastic materials, of the type wherein a

screw having a hub housed within a cylinder is rotatingly driven about its longitudinal axis at a predetermined speed and is divided along its length into at least three successive zones including a feed zone, a plasticizing zone and a homogenization zone, and wherein said plasticizing zone is provided with a helical thread of constant pitch integral with said hub and arranged for conveying said plastic material between said cylinder and said hub towards said homogenization zone, while said material plasticizes, said thread in said plasticizing zone having a multitude of narrow passages passing therethrough, each passage having a width less than its radial depth and in the range of from about 0.8 to 1 mm and connecting the downstream side of said thread with the upstream side thereof in such a manner that plastic material traverses said passages during its travel through the plasticizing zone, the passages thus providing for heating of the plastic material through surface contact with the thread.

4,085,462

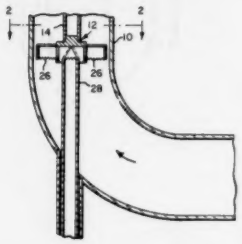
APPARATUS

Max Lorenz Booy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 4, 1977, Ser. No. 774,623

Int. Cl.[2] B01F *15/02*

U.S. Cl. 366—174 **4 Claims**



1. In a conduit for carrying a primary fluid flowing from an upstream direction, an apparatus positioned in said conduit for adding a secondary fluid to the primary fluid in said conduit comprising: an open cup positioned in said conduit, said cup being defined by a continuous side wall and a bottom wall; a plurality of troughs attached to spaced locations on and extending outwardly from said side wall, there being openings in said side wall at said spaced locations to allow communication from said cup to said troughs, each of said troughs having openings defined by edges, said edges having serrations therein, said trough openings and said cup opening facing the upstream direction of the conduit; and means for directing a stream of fluid to be added to the fluid in said conduit into said cup.

4,085,463

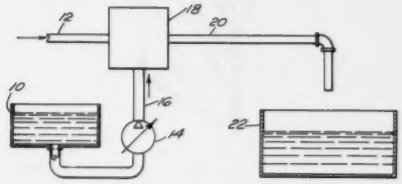
MIXING APPARATUS

Charles A. Wilson, Lincoln, R.I., assignor to General Signal Corporation, Stamford, Conn.

Filed Aug. 6, 1976, Ser. No. 712,177

Int. Cl.[2] B01F *15/02, 5/06*

U.S. Cl. 366—176 **4 Claims**



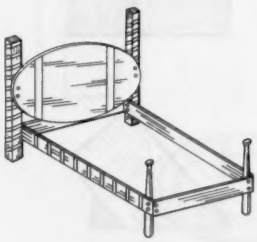
1. In combination a pump, said pump having an inlet connected to a supply of a first liquid material, a mixing chamber, a supply of a second liquid vehicle material connected to said chamber, the output of said pump connected to said mixing chamber, an elastomeric plug retained in said chamber, said plug having a solid wall, means including an inlet leading into said chamber, a seat about said inlet, said plug wall being urged against said seat, the pressure developed by said pump forcing the plug away from the seat to create an orifice whereby the first material is passed through said orifice into said chamber, said second material being passed into said chamber, discontinuities in the wall of said chamber substantially at right angles to the second material flow which creates turbulence, and a receiver for the output of said mixer.

DESIGNS

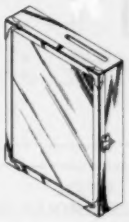
APRIL 18, 1978

247,726
COMBINED SHIRT AND CRAVAT
James A. D. Halliwell, 2051 Jordan Dr., Burnaby 2, British Columbia, Canada (V5B 4E9)
Filed Apr. 14, 1976, Ser. No. 676,716
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—209

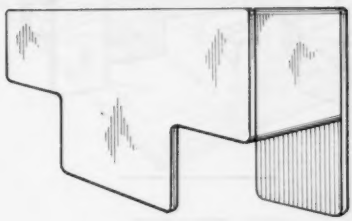
247,727
BEDSTEAD
Thomas R. Mitchell, 5856 Jefferson-Paige Rd., Shreveport, La. 71110
Filed Nov. 24, 1975, Ser. No. 634,364
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—83



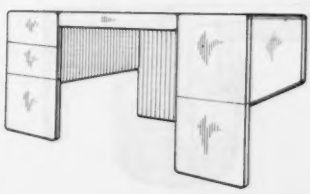
247,728
SLOTTED CONTAINER FOR RECEIVING PAID BILLS OR THE LIKE
Brian H. Nichols, 14115 - 45th St. N., Stillwater, Minn. 55082 55082
Filed Oct. 8, 1975, Ser. No. 620,649
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—127



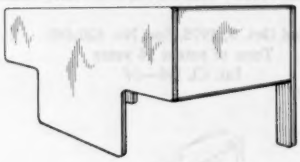
247,729
CREDENZA
A. Fuller Robinson, 408 St. Gabriel St., Montreal, Quebec, Canada
Filed Jul. 19, 1976, Ser. No. 706,873
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—159



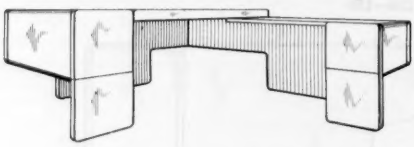
247,730
DESK
A. Fuller Robinson, 408 St. Gabriel St., Montreal, Quebec, Canada
Filed Jul. 19, 1976, Ser. No. 706,870
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



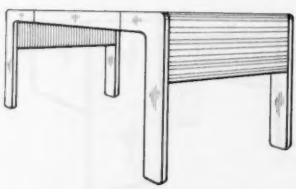
247,731
DESK
A. Fuller Robinson, 408 St. Gabriel St., Montreal, Quebec, Canada
Filed Jul. 19, 1976, Ser. No. 706,871
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



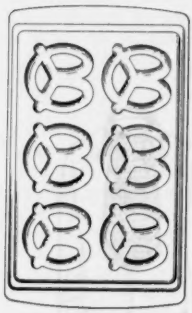
247,732
DESK
A. Fuller Robinson, 408 St. Gabriel St., Montreal, Quebec, Canada
Filed Jul. 19, 1976, Ser. No. 706,872
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



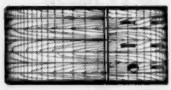
247,733
TABLE
A. Fuller Robinson, 408 St. Gabriel St., Montreal, Quebec, Canada
Filed Jul. 19, 1976, Ser. No. 706,874
Claims priority, application Canada, Apr. 9, 1976, 0904761
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



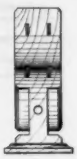
247,734
PRETZEL PAN
Delvin Richard Ryan, Jr., Terre Haute, Ind., assignor to The J. R. Clark Company, Stamford, Conn.
Filed Aug. 20, 1976, Ser. No. 716,169
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—43

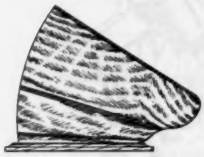


247,735
HOLDER FOR CUTLERY AND SHARPENING STEEL
Ronald J. Gangelhoff, Bemidji, Minn., and Robert L. Jacobi, Palatine, Ill., assignors to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed Sep. 24, 1976, Ser. No. 727,145
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74

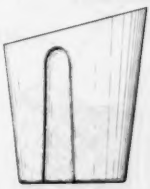


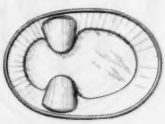
247,736
HOLDER FOR CUTLERY AND SHARPENER
Fred R. Gangelhoff, Largo, Fla., assignor to Chicago Cutlery Consumer Products, Inc., Minneapolis, Minn.
Filed Sep. 24, 1976, Ser. No. 727,146
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—74



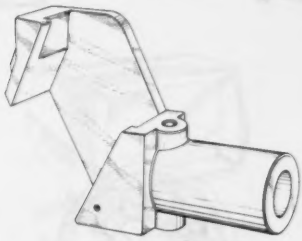


247,737
DOG FOOD SCOOP
Mark A. Alexander, Brockton, and Samuel F. Speers, North Attleboro, both of Mass., assignors to Ralston Purina Company, St. Louis, Mo.
Filed Aug. 16, 1976, Ser. No. 715,865
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—104

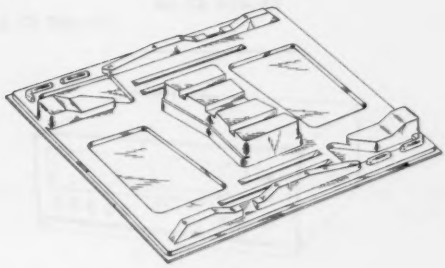




247,738
STUD MOUNTED BRACKET
Charles H. Rynearson, P.O. Box 69, Woodburn, Oreg. 97071
Filed Feb. 14, 1977, Ser. No. 768,356
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

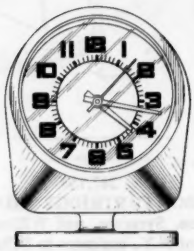


247,739
DUAL RIBBON CARTRIDGE SHIPPING TRAY
Anthony N. Paone, Syracuse, and William P. Montgomery, Cortland, both of N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Jul. 12, 1976, Ser. No. 704,266
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187



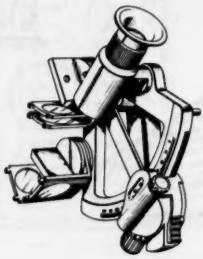
247,740
COMBINED CLOCK AND CASE
Frank A. Brady, Walnut Creek, Calif., assignor to General Time Corporation, Thomaston, Conn.
Filed Jul. 27, 1976, Ser. No. 709,210
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—18

247,741
CLOCK
Ellworth R. Danz, LaSalle, and John C. Crenshaw, Joliet, both of Ill., assignors to General Time Corporation, Thomaston, Conn.
Filed Aug. 19, 1976, Ser. No. 715,672
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—23



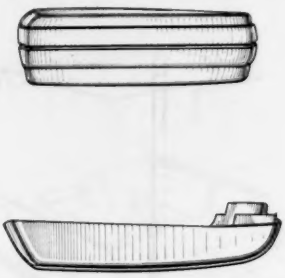
247,742
WRIST WATCH
Charles Davidson, 35 Old Post Rd. N., Croton-on-Hudson, N.Y. 10520
Filed Nov. 3, 1975, Ser. No. 628,291
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

247,743
SEXTANT
Gerd Finnern, Hamburg; Mario Fleig, Norderstedt; Friedrich Grothkopp, Hamburg; Peter Hein, Hamburg; Armin Rahn, Hamburg, and Lorenz Schneider, Kaltenkirchen, all of Germany, assignors to C. Plath, Hamburg, Germany
Filed Apr. 6, 1976, Ser. No. 674,103
Claims priority, application Germany, Oct. 10, 1975, AR 1808
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

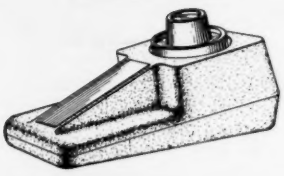


247,744
TIRE
Marcel Duchamp, Chamalieres, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Oct. 22, 1976, Ser. No. 735,112
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—137

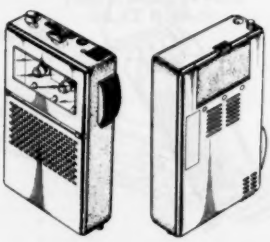
247,745
SIDE WING OF A CAR BUMPER
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Aug. 17, 1976, Ser. No. 715,005
Claims priority, application France, Mar. 1, 1976, 74.598
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—172



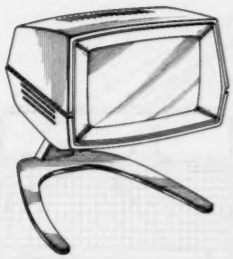
247,746
HAND HELD CONTROL UNIT
Randy K. Hall, Santa Clara, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Oct. 22, 1976, Ser. No. 734,981
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38



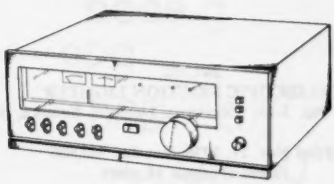
247,747
TAPE RECORDER
Shigeru Nemoto, Tachikawa, and Minoru Kobayashi, Hachioji, both of Japan, assignors to Olympus Optical Company Ltd., Tokyo, Japan
Filed May 25, 1977, Ser. No. 800,161
Claims priority, application Japan, Dec. 3, 1976, 5147179
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



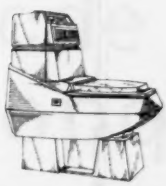
247,748
DISPLAY MONITOR OR SIMILAR ARTICLE
John Steven Ebner, Boca Raton; Francis Charles Pizzeri, Miami Shores, and Charles Grimes Sprecher, Pembroke Pines, all of Fla., assignors to Milgo Electronics Corporation, Miami, Fla.
Filed Mar. 2, 1976, Ser. No. 663,134
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43



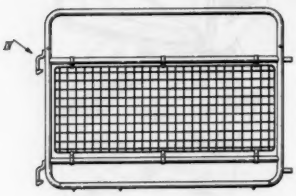
247,749
TUNER
Kazuhito Ohtomo, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Sep. 13, 1976, Ser. No. 722,461
Claims priority, application Japan, Mar. 27, 1976, 5111076
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71



247,750
FLUSH TOILET
Tien-Pao Lu, and Shun-Chi Lee, both of No. 21, Lane 109, Nan Ning Road, Tai Nan, China /Taiwan
Filed Sep. 13, 1976, Ser. No. 722,363
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65



247,751
PORTABLE CROWD CONTROL BARRICADE OR THE LIKE
William Edward Appleby, London, England, assignor to Tubular Barriers Limited, London, England
Filed Jun. 29, 1976, Ser. No. 700,832
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—45

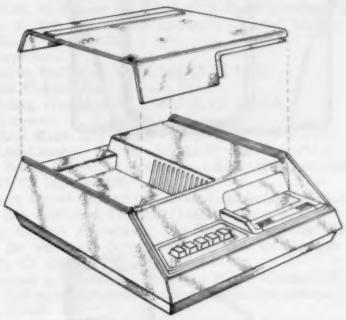


247,752
TELESCOPIC FRICTION LIGHTER
Taro Yanai, No. 3-13, Shirakawa 1-chome, Koto-ku, Tokyo, Japan
Filed Nov. 17, 1976, Ser. No. 742,656
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

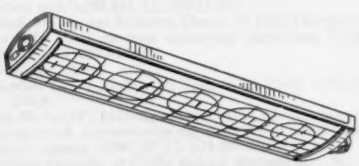
247,753
LIGHTER WITH MAGNETIZED TELESCOPIC TIP
Taro Yanai, No. 3-13, Shirakawa 1-chome, Koto-Ku, Tokyo, Japan
Filed Nov. 17, 1976, Ser. No. 742,655
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—38

247,754
HAND-HELD CONTROLLER FOR A VIDEO GAME OR THE LIKE
Nicholas F. Talesfore, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Aug. 23, 1976, Ser. No. 716,625
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R

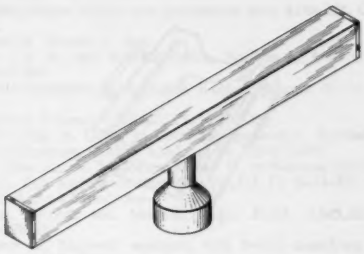
247,755
VIDEO GAME CONSOLE
Nicholas F. Talesfore, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Aug. 23, 1976, Ser. No. 716,848
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 R



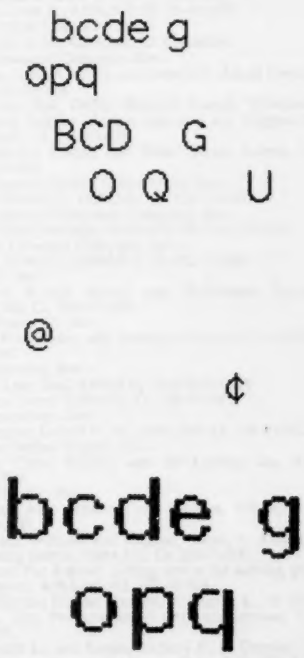
247,756
SUN LAMP
Petrus Jacobus Johanna Nagelkerke, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 31, 1975, Ser. No. 645,917
Claims priority, application Netherlands, Feb. 7, 1975, 5040001
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—20 H



247,757
SHELF LIGHT
Anthony C. Donato, Westfield, and Gerald Thurston, Cranford, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.
Filed Dec. 27, 1976, Ser. No. 754,611
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



247,758
TYPE FONT
Timothy H. Archer, Washington Court House, Ohio, assignor to The Mead Corporation
Filed May 18, 1976, Ser. No. 687,552
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B

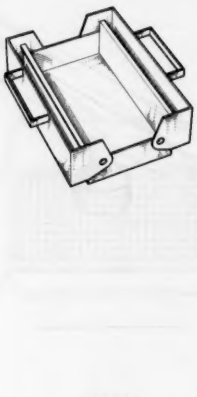


247,759

CARRYING CASE FOR TAPE CASSETTES

Ole Winther, Helsingor, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden

Filed Aug. 11, 1976, Ser. No. 713,542
Claims priority, application Sweden, Feb. 16, 1976, 760360
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D

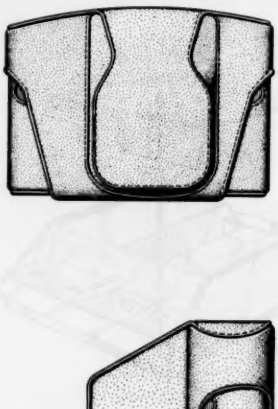


247,760

CARRYING CASE FOR A PHOTOGRAPHIC CAMERA

Gunter Rausch, Brunswick, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Aug. 24, 1976, Ser. No. 717,206
Claims priority, application Germany, Mar. 10, 1976, 1081
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 E



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TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF APRIL, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.T.M.B. Societe Anonyme: *See*—
Naimo, Jean-Pierre, 4,084,289, Cl. 16-96.00R.

Aasen, Torulf F.; Nisenson, Jules; and Pegg, Charles E., to Pitney-Bowes, Inc. Copying machine. 4,084,901, Cl. 355-16.000.

Aatinen, Eino, to Valmet Oy. Method of manufacturing, for a paper machine or the like, a roll having a grooved exterior surface. 4,084,302, Cl. 29-148.40D.

AB Sjuntorp: *See*—
Hallhagen, Rudolf G., 4,084,380, Cl. 61-1.00F.

AB Svenska Flaktfabriken: *See*—
Strindehag, Ove Magnus, 4,084,633, Cl. 165-8.000.

AB Volvo: *See*—
Ternehall, Runo Roy Oskar, 4,084,671, Cl. 192-30.00W.

Abend, Karl-Ludwig; Mattes, Bernhard; and Scheyhing, Hans, to Robert Bosch GmbH. Automotive vehicle speed control system. 4,084,659, Cl. 180-105.00E.

Abner, Larry David. Device for connecting corrugated drainage tiles and the like. 4,084,844, Cl. 285-373.000.

Abramyan, Evgeny Aramovich; and Sharapa, Anatoly Nikolaevich. Device for electrical deceleration of flow of charged particles. 4,085,376, Cl. 328-233.000.

Aczel, Thomas; and Plumlee, Karl W., to Exxon Research & Engineering Co. Hydrogen donor solvent coal liquefaction process. 4,085,032, Cl. 208-10.000.

Adachi, Ikuo; Ueda, Motohiko; and Kimoto, Sadatoshi, to Shionogi & Co., Ltd. 1,2-Benzoisoxazole derivatives and the production thereof. 4,085,114, Cl. 260-307.0DA.

Adachi, Syozo; and Tamori, Masato, to Iwatsu Electric Co., Ltd. Electrophotographic liquid developer containing a graft copolymer of a cyclized rubber. 4,085,058, Cl. 252-62.10L.

Adair, Edwin L. Method of sealing concentric tube ends to make sealed dual-wall tube. 4,085,185, Cl. 264-248.000.

Adams, James E.: *See*—
Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, 4,084,966, Cl. 96-1.0PS.

Adams, James R., Jr.; and Wilwerding, Dennis J., to Rollei of America, Inc. Remote sensor trigger circuit. 4,085,353, Cl. 315-241.00P.

Addressograph-Multigraph Corporation: *See*—
Schweitzer, Roy C.; and Fiori, Lee B., 4,084,510, Cl. 101-365.000.

Adolf, Horst R.: *See*—
Mein, Peter G.; and Adolf, Horst R., 4,085,191, Cl. 423-208.000.

Aerojet-General Corporation: *See*—
O'Brien, Charles J., 4,085,061, Cl. 252-301.10W.

Agence Nationale de Valorisation de la Recherche: *See*—
Chehikian, Alain; and Bouvier, Gerard, 4,085,401, Cl. 340-146.3AE.
Dubois, Jacques E.; and Miller, John A., 4,085,443, Cl. 364-900.000.
Neveu, Jean-Louis; and Melancon, Sylvio, 4,084,930, Cl. 425-198.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Pinard, Jacques Andre; and Juncar, Patrick Pierre Paul, 4,084,907, Cl. 356-106.00S.

Agency of Industrial Science & Technology: *See*—
Sano, Shiro; Hayashi, Hiroshi; and Takagi, Hiroyoshi, 4,084,979, Cl. 106-58.000.
Shimazaki, Kazumi; and Hirayama, Hiroyuki, 4,085,258, Cl. 429-125.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Self-starting amplifier circuit. 4,085,359, Cl. 323-22.00T.

Ahn, Byong-Ho; Gilinson, Philip J., Jr.; and Moscaritolo, Anthony Michael, to Charles Stark Draper Laboratory, Inc. Torque reaction motor performance evaluation. 4,084,428, Cl. 73-117.300.

Aigrain, Pierre; Broussaud, Georges; Peltier, Jean Paul; and Spitz, Erich, to Thomson-Brandt. Method for protecting against drop-outs in a sound signal recorded on a video-disc. 4,085,426, Cl. 360-38.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Hashimoto, Masanao; Saitou, Tadashi; Kobayashi, Tatsuo; and Suzuki, Isamu, 4,084,373, Cl. 60-293.000.

Akonteh, Ayola Ngwa; and Kwor, Y. C. Richard. Skateboard with control unit. 4,084,831, Cl. 280-11.200.

Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Hydrothermally stable catalysts containing ammonium faujasite zeolites. 4,085,069, Cl. 252-455.00Z.

Alarmco Inc.: *See*—
Leslar, David Louis; and Kirk, John Cyril, 4,085,292, Cl. 179-2.00A.

Albers, Norbert C., to Designeers Midwest, Division Maswill Industries Incorporated. Apparatus for dispensing rings and for applying piston rings to pistons. 4,084,727, Cl. 221-298.000.

Albertazzi, Gastone, to Finike Italiana Marposs Soc. In. Accomandita Semplice di Mario Possati & C. Apparatus for measuring geometrical dimensions and/or errors on a mechanical part. 4,084,322, Cl. 33-174.00L.

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Smith, Lee H.; and Alexandrowicz, Norman J., 4,084,675, Cl. 192-95.000.

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Kunzmann, Konrad, 4,084,631, Cl. 164-4.000.

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Allebach, Gene E.; and Wisebaker, Robert E., to National Machinery Company, The. High speed transfer. 4,084,278, Cl. 10-76.00T.

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Rhodes, Deryck; and Newton, Roger Frank, 4,085,222, Cl. 424-278.000.

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Buff, Ernest Dorchester; and Plaut, Jonathan, 4,084,840, Cl. 280-744.000.

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Coxhill, Major, 4,084,756, Cl. 241-213.000.
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Allmanna Svenska Elektriska Aktiebolaget: *See*—
Schultz, Goran; and Wiberg, Karl-Gunnar, 4,084,307, Cl. 29-460.000.

Allred, Victor Dean, to Marathon Oil Company. Combined combustion for in-situ retorting of oil shales. 4,084,640, Cl. 166-259.000.

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Nielsen, Tore Bernt; and Alm, Oddvar, 4,084,994, Cl. 149-44.000.
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Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 4,084,850, Cl. 297-317.000.

Amdall, John K., to Caterpillar Tractor Co. Modified hypotrochoidal rotary mechanism. 4,084,927, Cl. 418-61.00A.

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Barker, Loren B., 4,084,306, Cl. 29-431.000.

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Clem, Arthur G., 4,084,382, Cl. 61-36.00R.

American Cyanamid Company: *See*—
DiLeone, Roland Ralph; and Robustelli, Albert George, 4,085,166, Cl. 260-876.00R.
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, 4,085,045, Cl. 210-58.000.
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American Security Equipment Company: *See*—
Lepow, Mark Norman, 4,084,879, Cl. 339-198.0GA.

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DeWitt, David A., 4,084,911, Cl. 402-15.000.

Ametek, Inc.: *See*—
McIntyre, Robert Alfred; and Wolverton, Kenneth Harlan, 4,085,303, Cl. 200-61.410.

Ammons, Vernon G.: *See*—
Chang, Wen-Hsuan; and Ammons, Vernon G., 4,085,092, Cl. 260-77.5AN.

AMP Incorporated: *See*—
Dinger, Leon Joel, 4,084,876, Cl. 339-95.00D.
Pritulsky, James, 4,084,872, Cl. 339-19.000.

Ampex Corporation: *See*—
Harshberger, Robert P., Jr., 4,085,354, Cl. 318-87.000.

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Wolters, Tjako Aaldrik; and de Koning, Jan, 4,084,334, Cl. 37-67.000.

Anderson, Jack W.: *See*—
Anderson, Jack William; and Hughes, Glenn, 4,084,748, Cl. 239-74.000.

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Anderson, Thomas F.; and Hartless, Arlington L., to Dow Chemical Company, The. Pre-accelerated resin composition. 4,085,160, Cl. 260-837.00R.

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Glass articles with hematite and/or magnetite and/or metallic iron surfaces. 4,084,973, Cl. 106-39.700.

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Gravina, Anthony N.; Lev, Kenneth D.; and Angst, Arthur H., 4,085,363, Cl. 324-162.000.

Anhalt, Alfred E., to Stoelting Brothers Company. Slush freezer. 4,084,407, Cl. 62-342.000.

Anritsu Electric Company Limited: *See*—
Kuroda, Masahiro; and Yoshimura, Hiromitsu, 4,085,389, Cl. 332-31.00T.

Ansberg, Chris; and Maisel, Klaus, to International Standard Electric Corporation. Synchronous switching means for operating cable marking apparatus. 4,085,357, Cl. 318-590.000.

Ansul Company, The: *See*—
Rasheed, Khalid; and Warkentin, James D., 4,084,954, Cl. 71-90.000.

Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., to Swiss Aluminium Limited. Aluminum base alloys containing zinc, magnesium, iron and cadmium, tin or lead. 4,084,963, Cl. 75-138.000.

Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Hydrocarbon dehydrogenation using a nonacidic catalyst of a platinum group metal, rhenium, cobalt, tin, and an alkali or alkaline earth metal on a porous carrier. 4,085,154, Cl. 260-668.00D.

Aoki, Mitsuo; Watanabe, Kazuhiko; Murase, Shunichi; and Hiraoka, Isao, to Otsuka Pharmaceutical Factory, Inc. Amino acid parenteral solution containing reducing sugar. 4,085,207, Cl. 424-180.000.

Aoki, Takashi: *See*—
Mizutani, Yutaka; and Aoki, Takashi, 4,084,336, Cl. 37-184.000.

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Aoyagi, Hayao: *See*—
Kukino, Yoshinori; Miura, Mitsuo; and Aoyagi, Hayao, 4,084,383, Cl. 61-36.00R.

Applequist, Michael D.: *See*—
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,085,065, Cl. 252-437.000.

Arai, Kenichi: *See*—
Yamaoka, Sadao; and Arai, Kenichi, 4,084,900, Cl. 355-14.000.

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Takahashi, Katuhiko; Arimoto, Kyozo; Arai, Yoshiyuki; Morinaga, Tsuyoshi; and Nakazawa, Yuji, 4,085,274, Cl. 560-176.000.

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Lindsey, Joseph W., 4,084,587, Cl. 128-193.000.

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Ariga, Nagao; Nanbu, Junji; and Oikawa, Hiroshi, to Dainippon Ink and Chemicals, Inc. Photocurable resin compositions. 4,085,018, Cl. 204-159.150.

Arimoto, Kyozo: *See*—
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Armstrong Cork Company: *See*—
Heckles, John S.; and Miller, Norman L., 4,085,081, Cl. 260-31.40R.
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Armstrong, Currie: *See*—
Christophersen, Clarence E.; and Armstrong, Currie, 4,084,724, Cl. 221-20.000.

Armstrong, T. Wayne. Round hay bale loading and unloading carrier. 4,084,711, Cl. 214-1.0HH.

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Spotts, Willard; Arrandale, Thomas P.; and Spotts, Glenn R., 4,084,491, Cl. 98-121.00A.

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Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Karikawa, Tohru, 4,085,413, Cl. 354-137.000.

Asano, Kiyoji, to Shinsei Kogyo Co., Ltd. Toy construction set. 4,084,344, Cl. 46-28.000.

Asawa, Charles K.; and Plant, Thomas K., to Hughes Aircraft Company. Stark-tuned laser modulator. 4,085,387, Cl. 331-94.50M.

Ashfield, Herbert Edward; and Horsfall, Harry, to David Brown Tractors Limited. Control for a tractor power lift mechanism. 4,084,641, Cl. 172-9.000.

Ashland Oil, Inc.: *See*—
McConnell, Robert B.; and Keuer, Douglas W., 4,085,126, Cl. 260-404.000.

Aspaas, Finn. Frame and sash for doors and windows. 4,084,361, Cl. 52-204.000.

Asselman, George Albert Apolonia; Van der AA, Herman Henricus Maria; and Meijer, Roelf Jan, to U.S. Philips Corporation. Heating system. 4,084,376, Cl. 60-523.000.

Astro Development Corporation: *See*—
Dudek, Harold M., 4,084,654, Cl. 180-44.00R.

Atallah, Khaled; Berthold, Fritz; Kolbe, Wolfgang; Rauschenbach, Peter; and Simon, Helmut. Method and circuit for determining the quench corrected counting efficiency of liquid scintillation samples. 4,085,325, Cl. 250-328.000.

Atkins, Lyle D., to Biolec Corporation. Biological apparatus for generating electrical power and process for producing bacteria electrolyte. 4,085,254, Cl. 429-2.000.

Atkins, Thomas Joseph, to Du Pont de Nemours, E. I., and Company. Bicyclic and tricyclic trisaminomethanes. 4,085,106, Cl. 260-256.40F.

Atlantic Richfield Company: *See*—
Gallagher, James P.; and Mooi, John, 4,085,068, Cl. 252-455.00R.

Atomic Energy of Canada Limited: *See*—
Bertram, Robert W.; Norgate, Graham; and Isles, Robert, 4,085,398, Cl. 338-25.000.

Augis, Jacques Armand; Chen, Ho Sou; and Leamy, Harry John, to Bell Telephone Laboratories, Incorporated. Electric fuse. 4,085,396, Cl. 337-290.000.

Augstein, Joachim; Cairns, Hugh; and Rogers, Norman Harold, to Fisons Limited. Carboxamido tetrazoles. 4,085,115, Cl. 260-308.00D.

Aupac Kabushiki Kaisha: *See*—
Yoshida, Yuzuru, 4,085,346, Cl. 310-246.000.

Australian Atomic Energy Commission: *See*—
Thackray, Malcolm, 4,085,331, Cl. 250-493.000.

Automatic Specialties, Inc.: *See*—
Moineau, Hubert J., 4,084,624, Cl. 140-80.000.
Moineau, Hubert J., 4,084,779, Cl. 248-318.000.

Automobiles Peugeot: *See*—
Bonnaud, Michel, 4,084,765, Cl. 242-107.40B.

Avins, Jack, to RCA Corporation. Automatic control of free wheeling. 4,084,672, Cl. 192-.055.

AVX Corporation: *See*—
Galvagni, John L., 4,085,435, Cl. 361-433.000.

Ayres, John E. Fluid dispensing pump assembly. 4,084,731, Cl. 222-380.000.

B. E. Wallace Products Corporation: *See*—
Wallace, Bernard E., 4,084,794, Cl. 254-189.000.

B. F. Goodrich Company, The: *See*—
Morningstar, Marion George; and Bowles, Robert Lewis, 4,085,267, Cl. 526-74.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.

Babicka, Josef, deceased: *See*—
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.

Babickova, Marie, legal representative; Eva Zemanova, heir; Lubos Babicka, heir: *See*—
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.

Babushkina, Natalya Borisovna: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Taygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.

Back, Gerhard: *See*—
Beffa, Fabio; Buhler, Arthur; Donath, Peter; Schutz, Hans Ulrich; and Back, Gerhard, 4,085,097, Cl. 260-145.00A.

Badgley, C. Brent: *See*—
Russell, Arvin E., 4,084,706, Cl. 214-1.00D.

Badgley, Clifford E.: *See*—
Russell, Arvin E., 4,084,706, Cl. 214-1.00D.

Bae, Hyung Du, to International Telephone and Telegraph Corporation. Vibration densitometer. 4,084,425, Cl. 73-32.00A.

Baehr, Edward F., to United States of America, National Aeronautics and Space Administration. Flow compensating pressure regulator. 4,084,612, Cl. 137-484.200.

Bagby, John P.; Figge, Erwin E.; and Kim, Raymond W. H., to Bell & Howell Company. Film advancement control for motion picture projector. 4,084,892, Cl. 352-29.000.

Baker, Donald B.; and Sparko, William E., to Bird Machine Company, Inc. Spray cooling system. 4,085,171, Cl. 261-36.00R.

Ballast-Nedam Groep N.V.: *See*—
Wolters, Tjako Aaldrik; and de Koning, Jan, 4,084,334, Cl. 37-67.000.

Balmer, Oskar: *See*—
Focke, Heinz; and Balmer, Oskar, 4,084,627, Cl. 141-11.000.

Balz, Gunther W., to Roto-Finish Company. Finishing method. 4,084,355, Cl. 51-313.000.

Bankers Trust of South Carolina: *See*—
Frier, David Lee, 4,084,520, Cl. 109-56.000.

Banno, Yukio: *See*—
Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, 4,084,841, Cl. 280-745.000.

Baradel, Pierpaolo: *See*—
Bussi, Giancarlo; and Baradel, Pierpaolo, 4,085,054, Cl. 252-49.300.
Baranov, Vladimir Nikitich: *See*—
Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Kolyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna, 4,084,484, Cl. 90-24.00C.
Baranowski, Conrad J. Method and apparatus for improving packaging density of discrete electronic components. 4,085,433, Cl. 361-396.000.
Barash, David: *See*—
Schorsch, John B.; Graul, William E.; and Barash, David, 4,084,387, Cl. 62-63.000.
Barber, Herbert Douglas; and Salter, Gary Curtis, to Linear Technology Inc. Class B amplifier. 4,085,382, Cl. 330-262.000.
Barker, Loren B., to American Chain & Cable Company, Inc. Method and apparatus for transporting and wrapping pipe insulation. 4,084,306, Cl. 29-431.000.
Barlow, Edson L., to MHz Enterprises, Inc. Antenna matching network. 4,085,405, Cl. 343-858.000.
Baron, Henry J. Contact lens. 4,084,890, Cl. 351-160.000.
Baron, Oscar: *See*—
Baron, Raul; and Baron, Oscar, 4,084,792, Cl. 254-106.000.
Baron, Raul; and Baron, Oscar. Cargo holder jack. 4,084,792, Cl. 254-106.000.
Bartley, William E.: *See*—
Rule, Adrian O.; and Bartley, William E., 4,084,570, Cl. 126-140.000.
Bartolini, Robert Alfred: *See*—
Bloom, Allen; Ross, Daniel Louis; Bartolini, Robert Alfred; and Hung, Ling Kong, 4,084,970, Cl. 96-88.000.
BASF Aktiengesellschaft: *See*—
Daumiller, Guenther; Merkel, Karl; Neumayr, Franz; and Schneider, Kurt, 4,085,269, Cl. 544-221.000.
Ohlinger, Manfred; Wagner, Gerhard; Honecker, Gerhard; Stritzinger, Heinz; and Spaehn, Heinz, 4,084,936, Cl. 21-2.70R.
Seib, Karl; Schwarz, Wolfgang; and Gausepohl, Hermann, 4,085,264, Cl. 526-47.000.
BASF Wyandotte Corporation: *See*—
Otrhalek, Joseph V.; Gomes, Gilbert Stephen; and Elfers, Gunther Hans, 4,085,000, Cl. 162-16.000.
Bathiany, Robert H.; and Jensen, Bernhard, to Wiltron Company. Measurement of frequency response with improved sensitivity and accuracy. 4,085,361, Cl. 324-57.0SS.
Battelle Development Corporation: *See*—
Nack, Herman; and Liu, Ke-Tien, 4,084,545, Cl. 122-4.00D.
Battelle Memorial Institute: *See*—
Columberg, Alfred, 4,085,070, Cl. 252-429.00R.
Bauer, Adolf: *See*—
Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, 4,085,216, Cl. 424-263.000.
Bauer Bros. Co., The: *See*—
Egan, John J., 4,085,040, Cl. 209-244.000.
Bauer, Johann: *See*—
Kratel, Gunter; Bauer, Johann; Pichler, Engelbert; and Kalmuk, Hans-Peter, 4,085,087, Cl. 260-42.490.
Bausch & Lomb Incorporated: *See*—
Clark, James A., 4,084,459, Cl. 82-1.00C.
Baxter Travenol Laboratories, Inc.: *See*—
Cromie, Harry W., 4,084,758, Cl. 242-18.00G.
Mittleman, Herbert, 4,084,606, Cl. 137-102.000.
Bayer Aktiengesellschaft: *See*—
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, 4,084,984, Cl. 106-300.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,085,226, Cl. 424-322.000.
Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,085,141, Cl. 260-570.00R.
BBC Brown Boveri & Company Limited: *See*—
Meyer, Gundolf, 4,084,989, Cl. 148-11.50R.
Zboril, Josef, 4,084,920, Cl. 415-174.000.
Beach, Janet. Receptacle for collecting urine samples. 4,084,937, Cl. 23-259.000.
Beall, George H.; and Rittler, Hermann L., to Corning Glass Works. Method of making light-absorbing glass-ceramic articles. 4,084,974, Cl. 106-39.700.
Beard, David E.: *See*—
Dewsnap, Ronald F.; Higgins, Andrew D.; and Beard, David E., 4,084,798, Cl. 266-131.000.
Becker, Allen: *See*—
Humphrey, William D.; and Becker, Allen, 4,084,914, Cl. 404-10.000.
Becker, Willi. Mobile home frame. 4,084,834, Cl. 280-106.00T.
Becton, Dickinson and Company: *See*—
Rao, Pemmaraju Narasimha, 4,085,202, Cl. 424-1.000.
Beekenkamp, Gerald, to Black and Decker Manufacturing Company, The. Clamp and clamping arrangement for holding a workpiece. 4,084,803, Cl. 269-91.000.
Beffa, Fabio; Buhler, Arthur; Donath, Peter; Schutz, Hans Ulrich; and Back, Gerhard, to Ciba-Geigy AG. Process for the manufacture of chromium complexes from metallizable azo or azo methine dyes. 4,085,097, Cl. 260-145.00A.
Behr, Friedrich: *See*—
Schulten, Rudolf; and Behr, Friedrich, 4,085,200, Cl. 423-579.000.
Belardi, Richard J.; Moyer, Norman E.; and Ho, Ernest C., to Hughes Aircraft Company. Digital watch with two buttons and improved setting and display control. 4,084,401, Cl. 58-4.00A.
Bell & Howell Company: *See*—
Bagby, John P.; Figge, Erwin E.; and Kim, Raymond W. H., 4,084,892, Cl. 352-29.000.
Bell Telephone Laboratories, Incorporated: *See*—
Augis, Jacques Armand; Chen, Ho Sou; and Leamy, Harry John, 4,085,396, Cl. 337-290.000.
Bobeck, Andrew Henry; Bonyhard, Peter Istvan; and Nelson, Terence John, 4,085,453, Cl. 365-8.000.
Runge, Peter Klaus, 4,084,308, Cl. 29-527.200.
Seidel, Harold, 4,085,298, Cl. 179-175.30R.
Tompsett, Michael Francis, 4,085,456, Cl. 365-114.000.
Yeh, Yu Shuan, 4,085,368, Cl. 325-304.000.
Bendix Corporation, The: *See*—
Burnett, Richard Thomas, 4,084,665, Cl. 188-73.300.
Gaiser, Robert F., 4,084,377, Cl. 60-535.000.
Gallant, Janice Anne, 4,085,404, Cl. 343-754.000.
Myers, Bruce B., 4,084,304, Cl. 29-157.10R.
VanderVeen, Jaring, 4,084,857, Cl. 301-6.00A.
Bennett, John E.; and Elliott, Joseph E., to Diamond Shamrock Corporation. Elimination of impurities from sea water cell feed to prevent anode deposits. 4,085,014, Cl. 204-95.000.
Beppu, Yositugu: *See*—
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,085,169, Cl. 260-886.000.
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Method of increasing feed utilization. 4,085,224, Cl. 424-283.000.
Berg, Donald L. Screw removing tool. 4,084,457, Cl. 81-425.00R.
Bernhard, Horst; and Marquard, Kurt, to Merck Patent Gesellschaft mit beschrankter Haftung. Dyed lustrous pigments. 4,084,983, Cl. 106-289.000.
Berthold, Fritz: *See*—
Atallah, Khaled; Berthold, Fritz; Kolbe, Wolfgang; Rauschenbach, Peter; and Simon, Helmut, 4,085,325, Cl. 250-328.000.
Bertram, Robert W.; Norgate, Graham; and Isles, Robert, to Atomic Energy of Canada Limited. Thin film resistance temperature detector. 4,085,398, Cl. 338-25.000.
Beswick, Geoffrey Ernest, to Imperial Chemical Industries Limited. Process for preparing o-hydroxyarylaldehydes. 4,085,146, Cl. 260-600.00R.
Bethlehem Steel Corporation: *See*—
Singleton, Alan H.; Homberg, Otto A.; and Sheldrake, Charles W., 4,085,199, Cl. 423-574.00R.
Betstone Industries Limited: *See*—
Willis, David John; Stevenson, Dennis Clifford; and Bettle, William, 4,084,274, Cl. 5-61.000.
Bettle, William: *See*—
Willis, David John; Stevenson, Dennis Clifford; and Bettle, William, 4,084,274, Cl. 5-61.000.
Bhuta, Pravin G.: *See*—
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,084,427, Cl. 73-88.00A.
Bianchi, John E.; and Nichols, Richard D. E., to Bianchi Leather Products, Inc. Combined shoulder and belt holster. 4,084,734, Cl. 224-2.00B.
Bianchi Leather Products, Inc.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,084,734, Cl. 224-2.00B.
Bibbero, Robert J., to Honeywell Inc. Multigas digital correlation spectrometer. 4,084,906, Cl. 356-96.000.
Bick, Rodger L.; and Fekete, Lajos F., to Bick, Rodger L.; Fekete, Lajos F.; and Wilson, William L. Clottable fibrinogen free Factor VIII product and process. 4,085,095, Cl. 260-112.00B.
Bicking, John B.: *See*—
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,085,125, Cl. 260-402.000.
Biggins, Walter F., to Dexter Corporation, The. Surgical face mask filtering medium. 4,084,949, Cl. 55-524.000.
Bijon, Jean-Paul: *See*—
Lainez, Lucien; Fichot, Bernard; and Bijon, Jean-Paul, 4,084,694, Cl. 206-444.000.
Billerbeck, Wilfred Jerome; and Jacobus, Nelson Mortimer, Jr., to Communications Satellite Corporation. High voltage transformer package. 4,085,395, Cl. 336-61.000.
Bilweis, Joseph, to Ethicon, Inc. Dispenser for surgical threads. 4,084,692, Cl. 206-403.000.
Bindra, Jasjit S., to Pfizer Inc. Tetrazolo[A]quinazol-5-ones antiallergy and antiulcer agents. 4,085,213, Cl. 424-251.000.
Biolec Corporation: *See*—
Atkins, Lyle D., 4,085,254, Cl. 429-2.000.
Bird Machine Company, Inc.: *See*—
Baker, Donald B.; and Sparko, William E., 4,085,171, Cl. 261-36.00R.
Biskeborn, Merle C., to Phelps Dodge Industries, Inc. Apparatus for monitoring core charging of waterproof communication cable. 4,084,997, Cl. 156-356.000.
Bissell, Inc.: *See*—
Rosendall, Henry J., 4,084,283, Cl. 15-48.000.
Black and Decker Manufacturing Company, The: *See*—
Beekenkamp, Gerald, 4,084,803, Cl. 269-91.000.
Black, John W., to Pemco-Kalamazoo, Inc. Shock absorber for swivel caster. 4,084,288, Cl. 16-21.000.
Blaich, Bernhard: *See*—
Zehender, Ernst; Blaich, Bernhard; Stein, Helmut; and Kerner, Karl, 4,085,248, Cl. 428-336.000.

Blake, William J. Waste gate control for supercharged engines. 4,084,378, Cl. 60-602.000.

Bleha, Miroslav; Votavova, Eva; and Plichta, Zdenek, to Ceskoslovenska akademie ved. Method of preparation of insoluble biologically active compounds. 4,085,005, Cl. 195-68.000.

Blevins, Margaret Mary; and Bluethman, Robert Glenn, to International Business Machines Corporation. Text merge with copies and envelopes. 4,085,445, Cl. 364-900.000.

Bloom, Allen; Ross, Daniel Louis; Bartolini, Robert Alfred; and Hung, Ling Kong, to RCA Corporation. Organic volume phase holographic recording media using sucrose benzoate. 4,084,970, Cl. 96-88.000.

Bluethman, Robert Glenn: *See—*
Blevins, Margaret Mary; and Bluethman, Robert Glenn, 4,085,445, Cl. 364-900.000.

Bobeck, Andrew Henry; Bonyhard, Peter Istvan; and Nelson, Terence John, to Bell Telephone Laboratories, Incorporated. Magnetoresistive detector for magnetic bubble memory. 4,085,453, Cl. 365-8.000.

Bodor, Nicolae S.: *See—*
Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, 4,085,214, Cl. 424-253.000.

Boehringer Ingelheim GmbH: *See—*
Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, 4,085,216, Cl. 424-263.000.

Boeing Company, The: *See—*
Marceau, J. Arthur; Firminhac, Ralph H.; and Moji, Yukimori, 4,085,012, Cl. 204-38.00A.

Boen, Charles G., to Caterpillar Tractor Co. Protective guard arrangement for track drive motors. 4,084,653, Cl. 180-9.480.

Bogert, Clayton. Safety closure for containers. 4,084,716, Cl. 215-217.000.

Boggild, Robert. Gymnastic pole and mount therefor. 4,084,814, Cl. 272-110.000.

Bohnlein, Horst. Multi-cylinder internal combustion engine. 4,084,554, Cl. 123-52.0MF.

Boke, Karin: *See—*
Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, 4,085,216, Cl. 424-263.000.

Boland, John Gordon, to Foster Cathead Corporation. Power tong apparatus. 4,084,429, Cl. 73-139.000.

Bolton, Ivan Joseph: *See—*
Mercer, Alec Victor; Littlewood, Peter Stuart; Bolton, Ivan Joseph; and Fleck, Fritz, 4,085,101, Cl. 260-239.900.

Bonnaud, Michel, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Winding device, in particular for a vehicle safety belt. 4,084,765, Cl. 242-107.40B.

Bonyhard, Peter Istvan: *See—*
Bobeck, Andrew Henry; Bonyhard, Peter Istvan; and Nelson, Terence John, 4,085,453, Cl. 365-8.000.

Boone, Ralph D.; and Griffin, Charles. Two-step roll ahead irrigation system. 4,084,610, Cl. 137-1.000.

Booth, Morris A., to Swanco. Method of forming a hermetically sealed container and the tools used therewith. 4,084,525, Cl. 113-1.00K.

Boots Company Limited, The: *See—*
Kay, David, 4,084,442, Cl. 73-432.0PS.

Booy, Max Lorenz, to Du Pont de Nemours, E. I., and Company. Apparatus. 4,085,462, Cl. 366-174.000.

Borg-Warner Corporation: *See—*
Jones, John Arthur, 4,085,282, Cl. 544-197.000.
Rickert, Paul E., 4,084,564, Cl. 123-139.0AV.

Bossi, Oscar G., to Societe Diete: Stabilimento Industriale Construzione Macchinario Attrezzature. Process for machining gears and machine for performing the same. 4,084,481, Cl. 90-1.60R.

Botts, Marion F.: *See—*
Doyle, William C., Jr.; and Botts, Marion F., 4,084,956, Cl. 71-111.000.

Bouvier, Gerard: *See—*
Chehikian, Alain; and Bouvier, Gerard, 4,085,401, Cl. 340-146.3AE.

Bowers, John R., to Phillips Petroleum Company. Apparatus for preparing cross-lapped film structures. 4,084,464, Cl. 83-94.000.

Bowles, Robert Lewis: *See—*
Morningstar, Marion George; and Bowles, Robert Lewis, 4,085,267, Cl. 526-74.000.

Boyadjieff, George I., to Varco International, Inc. Pile handing methods. 4,084,385, Cl. 61-53.500.

Boyer, Edward J., to Whittaker Corporation. Reversible rubrail for vessels. 4,084,533, Cl. 114-219.000.

Boyle, Henry Bryant; and Johnson, Alexander James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Load measurement. 4,084,430, Cl. 73-141.00R.

Bradley, W. L.; Frye, Bennie W.; and Raines, Joseph W. Method and apparatus for preventing theft of idling vehicles. 4,084,657, Cl. 180-114.000.

Brady, John F.: *See—*
Pyle, Lawrence F.; and Brady, John F., 4,084,912, Cl. 404-74.000.

Braun Aktiengesellschaft: *See—*
Flandorfer, Robert, 4,084,893, Cl. 352-141.000.

Bray Oil Co. Inc.: *See—*
Schenach, Thomas Anthony, 4,085,056, Cl. 252-59.000.

Brears, John H., to MacMillan Bloedel Limited. Method of finishing a random contoured surface. 4,084,356, Cl. 51-328.000.

Bremer, Noel J.: *See—*
Milberger, Ernest C.; Bremer, Noel J.; and Wong, Eunice K. T., 4,085,121, Cl. 260-346.750.

Brenneman, Daniel A., to Fedders Corporation. Chiller controls. 4,084,406, Cl. 62-211.000.

Bridgestone Tire Company Limited: *See—*
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.
Odaka, Fumio; Fujii, Yoshihiko; and Iseda, Yutaka, 4,085,165, Cl. 260-859.00R.

Briefer, Dennis K.: *See—*
Lee, Shih-Ying; and Briefer, Dennis K., 4,084,438, Cl. 73-706.000.

Brinegar, Claude E. Wire banding tool and cable splice. 4,084,625, Cl. 140-123.500.

Briody, Robert G., to PPG Industries, Inc. Preparation of monoperoxyphthalic acid. 4,085,133, Cl. 260-502.00R.

Briston, Rodney John; Canning, Rodger George; and Tomlinson, John Parker, to Reed International Limited. Process for manufacturing a differentially expanded resinous cellular sheet. 4,085,239, Cl. 427-208.000.

Britax (Wingard) Limited: *See—*
Cunningham, Douglas James, 4,084,848, Cl. 296-137.00E.

British Steel Corporation: *See—*
Dewsnap, Ronald F.; Higgins, Andrew D.; and Beard, David E., 4,084,798, Cl. 266-131.000.
Lewis, Richard, 4,084,444, Cl. 73-622.000.

Brock, Andrew J.: *See—*
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,084,963, Cl. 75-138.000.

Brock, Robert K.: *See—*
Landers, Don B.; and Brock, Robert K., 4,084,801, Cl. 267-140.000.

Brodrene Gram A/S: *See—*
Gram, Hans, 4,084,926, Cl. 418-19.000.

Brooks, Ronald L.: *See—*
Harlan, Martin L.; Krause, John A.; and Brooks, Ronald L., 4,084,292, Cl. 17-50.000.

Broussaud, Georges: *See—*
Aigrain, Pierre; Broussaud, Georges; Peltier, Jean Paul; and Spitz, Erich, 4,085,426, Cl. 360-38.000.

Brown, James W. High impact resistance door. 4,084,347, Cl. 49-397.000.

Brown, Thomas R., Sr.: *See—*
Oshinsky, Frank W.; and Brown, Thomas R., Sr., 4,084,705, Cl. 213-127.000.

Brown, William E.; Magee, Ramon J.; and McCoy, Dennis R., to Hallmark Cards, Incorporated. Synthetic resin cured in place rotary embossing counter roller. 4,084,500, Cl. 101-28.000.

Bruck, Avraham: *See—*
Mindick, Leo R.; Bruck, Avraham; Inbar, Dan; and Koss, Leopold G., 4,085,006, Cl. 195-103.700.

Brundiek, Horst, to Loesche Hartzerkleinerungs-und Zementmaschinen GmbH & Co. KG. Combined vane-rotor separator. 4,084,754, Cl. 241-52.000.

Buchser, William J., to Whirlpool Corporation. Ice piece dispenser. 4,084,725, Cl. 221-75.000.

Bucknell, Ernest H.; Rauh, Jack K.; and Radecki, Tony. Diaphragm spout assembly. 4,084,620, Cl. 137-801.000.

Budecker, Ludwig; and Winter, Klaus, to ITT Industries, Incorporated. Pressure responsive distributing valve. 4,084,604, Cl. 137-101.000.

Budrose, Charles R., to Upaya, Inc. Adjustable wrench. 4,084,455, Cl. 81-140.000.

Buff, Ernest Dorchester; and Plaut, Jonathan, to Allied Chemical Corporation. Vehicle sensitive retractor. 4,084,840, Cl. 280-744.000.

Buhler, Arthur: *See—*
Beffa, Fabio; Buhler, Arthur; Donath, Peter; Schutz, Hans Ulrich; and Back, Gerhard, 4,085,097, Cl. 260-145.00A.

Buhrer, Erwin. Device for lifting-lowering and rotating operations. 4,084,709, Cl. 214-1.0BB.

Bull, Jeffrey Lawrence; Murphy, Tanya Ellen; and Gibson, Laurence Ernest, to Murphy, Ian R., by said Tanya Ellen Murphy. Towed vehicle brake. 4,084,859, Cl. 303-106.000.

Bullard Company, The: *See—*
Grinage, Claude M., 4,084,462, Cl. 82-36.00R.

Bullat, Jean, to Etablissements CARPANO & PONS. Torque-limiting stop device. 4,085,345, Cl. 310-117.000.

Bullock, Robert L., to Standard Car Truck Company. Railroad car side frame construction. 4,084,513, Cl. 105-197.0DB.

Bullock, Robert L., to Standard Car Truck Company. Damping railway truck bolster friction shoe. 4,084,514, Cl. 105-197.0DB.

Bunker Ramo Corporation: *See—*
Dragisic, Joseph, 4,084,310, Cl. 29-564.400.
Liaukus, Sigitas Julius; and Jen, Dixson Teh-Chao, 4,085,442, Cl. 364-900.000.
Smith, Oliver Dale; and Goldberg, Gerald M., 4,085,059, Cl. 252-118.000.

Burgarella, John P.; Turner, George, Jr.; and Stephansky, Robert L., to Polaroid Corporation. Electronic flash apparatus with extendable on/off switch control apparatus. 4,085,414, Cl. 354-145.000.

Burge, Edward V. Hydraulic junk retriever. 4,084,636, Cl. 166-65.00M.

Burgess, Harry L. Drilling mud degasser. 4,084,946, Cl. 55-184.000.

Burke, Harry W., to Raymond Lee Organization, Inc., The, a part interest. Vehicle radio mounting device. 4,085,369, Cl. 325-312.000.

Burke, Richard Lerda: *See—*
Giordano, Annie Sue; Burke, Richard Lerda; and Wixon, Harold Eugene, 4,085,243, Cl. 427-387.000.

Burnett, Richard Thomas, to Bendix Corporation, The. Disc brake and mounting means therefor. 4,084,665, Cl. 188-73.300.

Burrell, Raymond Alexander; and Cos, John Michael, to Imperial

Chemical Industries Limited. Pesticidal dihydrotetrazolo [1,5-a] quinazoline compound and processes and compositions for using the same. 4,085,212, Cl. 424-251.000.
Burroughs Corporation: *See*—
Green, Keith; and Lawson, Alastair, 4,085,428, Cl. 360-99.000.
Simpson, Adam, 4,084,805, Cl. 271-4.000.
Tulpule, Bhalchandra Ramchandra, 4,085,450, Cl. 364-900.000.
Wolfe, John Edmond, 4,085,330, Cl. 250-492.00A.
Burroughs Wellcome Co.: *See*—
Telling, Ronald Charles; Passingham, Roy John; Kitchener, Brian Lewis; and Hopkinson, David George, 4,085,203, Cl. 424-89.000.
Buser, Kenneth Rene; Roedel, Milton John; and Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Simulated granite and its preparation. 4,085,246, Cl. 428-220.000.
Bussi, Giancarlo; and Baradel, Pierpaolo. Utilization of orthophosphoric esters for the production of aqueous fluids for working metals. 4,085,054, Cl. 252-49.300.
Butler, Frank M. Electric page turner. 4,084,468, Cl. 84-500.000.
Butler, Robert Gerald, to Copes-Vulcan Inc. Digital sootblower control systems and methods therefor. 4,085,438, Cl. 364-107.000.
Butts, Douglas Earl; and Rossborough, Walter Neil, to Rossborough Supply Company. Thermally stable injector lance. 4,084,800, Cl. 266-225.000.
Byrd Industries, Inc.: *See*—
Gardiner, William P., 4,084,793, Cl. 254-187.800.
C. van der Lely N.V.: *See*—
van der Lely, Cornelis, 4,084,394, Cl. 56-14.600.
van der Lely, Cornelis, 4,084,485, Cl. 91-210.000.
Cain, Gene; Teague, Joe Doyle; and Wright, Paul James, to Woodbine Corporation. Stabilization of earth subsurface layers. 4,084,381, Cl. 61-36.00C.
Cairns, Hugh: *See*—
Augstein, Joachim; Cairns, Hugh; and Rogers, Norman Harold, 4,085,115, Cl. 260-308.00D.
Caldon, Frank, to Sunshine Mining Company. Treatment of metal bearing mineral material. 4,084,961, Cl. 75-101.00R.
Calhoun, Fredrick L., to Industrial Dynamics Company, Ltd. Starwheel control in a system for conveying containers. 4,084,686, Cl. 198-468.000.
Calpis Shokuhin Kogyo Kabushiki Kaisha: *See*—
Kamada, Hidemoto; Miura, Chiaki; and Kano, Etsuo, 4,085,234, Cl. 426-618.000.
Calvert, Madeleine M. Rotary brush for removing hair from hair brushes. 4,084,282, Cl. 15-38.000.
Camilleri, Thomas M. Cushion blocks. 4,084,817, Cl. 273-53.000.
Canada-Cities Services, Ltd.: *See*—
Todd, John C., 4,084,637, Cl. 166-245.000.
Todd, John C., 4,084,639, Cl. 166-248.000.
Canada, Her Majesty in Right of, as Represented by the Minister of National Defence: *See*—
Carpenter, Wilfred C.; Schmitz, Gary N.; and Fenrick, Walter J., 4,084,440, Cl. 73-422.0GC.
Canadian Patents & Development Limited: *See*—
Rak, Jaromir R., 4,085,251, Cl. 428-485.000.
Schreiber, Ulrich; and Vidaver, William, 4,084,905, Cl. 356-85.000.
Canning, Rodger George: *See*—
Briston, Rodney John; Canning, Rodger George; and Tomlinson, John Parker, 4,085,239, Cl. 427-208.000.
Cannon, Harold Lee. Picture frame vise. 4,084,802, Cl. 269-41.000.
Canon Denshi Kabushiki Kaisha: *See*—
Hasegawa, Tachio, 4,085,429, Cl. 360-119.000.
Canon Kabushiki Kaisha: *See*—
Hasegawa, Tachio, 4,085,429, Cl. 360-119.000.
Hirabayashi, Yoichi; Minami, Setsuo; and Goshima, Takeshi, 4,084,881, Cl. 350-6.800.
Sekiguchi, Takeshi, 4,085,419, Cl. 358-55.000.
Cantarelli, Giorgio: *See*—
Carissimi, Massimo; Ravenna, Franco; and Cantarelli, Giorgio, 4,085,223, Cl. 424-278.000.
Capelli, Alfred J., to Sargent Industries, Inc. Bearing and bearing liner having a compliant layer. 4,084,863, Cl. 308-238.000.
Caraway, William Russell; and Falkingham, Clarence Mark, to Howmedica, Inc. Stoma drainage appliance. 4,084,590, Cl. 128-283.000.
Carissimi, Massimo; Ravenna, Franco; and Cantarelli, Giorgio, to Maggioni & C. S.p.A. Halogenated derivatives of 1,3-dioxolane having mucolytic activity. 4,085,223, Cl. 424-278.000.
Carley, Harold Edwin: *See*—
Miller, George Allen; and Carley, Harold Edwin, 4,085,209, Cl. 424-245.000.
Carlson, David T. Swivel drawer assembly. 4,084,518, Cl. 109-19.000.
Carpenter, Wilfred C.; Schmitz, Gary N.; and Fenrick, Walter J., to Canada, Her Majesty in Right of, as Represented by the Minister of National Defence. Chromatograph injection system. 4,084,440, Cl. 73-422.0GC.
Carus Corporation: *See*—
Mein, Peter G.; and Adolf, Horst R., 4,085,191, Cl. 423-208.000.
Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,085,312, Cl. 235-306.000.
Caspari, Gunter, to Standard Oil Company (Indiana). Metal dithiophosphate process and/composition. 4,085,053, Cl. 252-32.70E.
Castle & Cooke, Inc.: *See*—
Turover, Alan S., 4,085,233, Cl. 426-615.000.
Caswell, David Arlen: *See*—
Wenthe, Stephen James; and Caswell, David Arlen, 4,084,806, Cl. 271-80.000.
Caterpillar Tractor Co.: *See*—
Amdall, John K., 4,084,927, Cl. 418-61.00A.
Boen, Charles G., 4,084,653, Cl. 180-9.480.
Cole, Carroll R.; and Christian, Robert L., 4,084,335, Cl. 37-126.0AE.
Cole, Carroll R.; Dezelan, Joseph E.; and Easterling, Gene B., 4,084,644, Cl. 172-796.000.
Conroy, William E., 4,084,450, Cl. 74-713.000.
Easterling, Gene Baptist, 4,084,643, Cl. 172-795.000.
Johnson, Howard L., 4,084,609, Cl. 137-327.000.
Rowen, Harold E., 4,084,601, Cl. 137-49.000.
Schlecht, Charles H., 4,084,423, Cl. 72-256.000.
Stedman, Robert N., 4,084,715, Cl. 214-660.000.
Cavalieri, Michel: *See*—
Desplats, Andre; and Cavalieri, Michel, 4,084,788, Cl. 254-76.000.
Caw Industries, Inc.: *See*—
Willard, John Wesley, Sr., 4,084,938, Cl. 44-1.00R.
Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio, 4,084,850, Cl. 297-317.000.
Central Engineering Co., Inc.: *See*—
Herzog, Fritz W., 4,084,285, Cl. 15-87.000.
Cervantes, Ramon H. Detachable gun lock. 4,084,341, Cl. 42-1.00Y.
Ceskoslovenska akademie ved: *See*—
Bleha, Miroslav; Votavova, Eva; and Plichta, Zdenek, 4,085,005, Cl. 195-68.000.
Chakrabarty, Naresh; and Weitze, Artur, to Siemens Aktiengesellschaft. Producing thick film circuits having terminal elements. 4,084,314, Cl. 29-626.000.
Champeau, Marcel; and Tabutin, Andre, to Societe Ramo S.A. Automatic feed for a lathe. 4,084,461, Cl. 82-21.00B.
Champion International Corporation: *See*—
Stillman, Nathan, 4,085,244, Cl. 428-192.000.
Champion Spark Plug Company: *See*—
Hinton, Jonathan W., 4,084,976, Cl. 106-48.000.
Chang, Wen-Hsuan; and Ammons, Vernon G., to PPG Industries, Inc. Transparent, optically clear poly(lactone-urethane) interlayers for laminated safety glass. 4,085,092, Cl. 260-77.5AN.
Chang, Yun Feng: *See*—
Labana, Santokh S.; and Chang, Yun Feng, 4,085,260, Cl. 526-16.000.
Chang, Yun-Te. Pulley puller. 4,084,305, Cl. 29-261.000.
Charles Stark Draper Laboratory, Inc.: *See*—
Ahn, Byong-Ho; Gilinson, Philip J., Jr.; and Moscaritolo, Anthony Michael, 4,084,428, Cl. 73-117.300.
Chauvel, Bernard: *See*—
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,085,055, Cl. 252-50.000.
Chehikian, Alain; and Bouvier, Gerard, to Agence Nationale de Valorisation de la Recherche. Character recognition system. 4,085,401, Cl. 340-146.3AE.
Chemical Grout Company, Limited: *See*—
Yahiro, Teruo; and Yoshida, Hiroshi, 4,084,648, Cl. 175-67.000.
Chemisch-Pharmazeutische Fabrik Adolf Klinge & Co.: *See*—
Henschler, Dietrich; Wagner, Josef; and Hampel, Hans, 4,085,270, Cl. 560-105.000.
Chemische Werke Huels, A.G.: *See*—
Scharf, Helmut, 4,085,240, Cl. 427-302.000.
Chen, Ho Sou: *See*—
Augis, Jacques Armand; Chen, Ho Sou; and Leamy, Harry John, 4,085,396, Cl. 337-290.000.
Chen, Thomas T.; and Gergis, Isoris S., to Rockwell International Corporation. Bubble domain circuit organization. 4,085,451, Cl. 365-4.000.
Chenel, Pierre; and Vachet, Joel, to Saint-Gobain Industries. Process and apparatus for applying plastic filaments to sheets for multiple pane windows. 4,085,238, Cl. 427-207.00A.
Cheng, Paul J., to Phillips Petroleum Company. Carbon black process. 4,085,197, Cl. 423-450.000.
Cheng, Richard C. M. Model track section. 4,084,746, Cl. 238-10.00F.
Chiang, Mutong T.: *See*—
Gibbons, John P.; and Chiang, Mutong T., 4,085,075, Cl. 260-17.200.
Milkovich, Ralph; and Chiang, Mutong T., 4,085,168, Cl. 260-886.000.
Chicago Pneumatic Tool Company: *See*—
Wallace, William K., 4,084,487, Cl. 91-325.000.
Chikatsu, Masahiro, to Sony Corporation. Limiter circuit. 4,085,431, Cl. 361-56.000.
Chirico, Anthony N., to Ecodyne Corporation. Entrainment separator apparatus. 4,084,945, Cl. 55-38.000.
Chirico, Anthony Nicholas, to Ecodyne Corporation. Pure distillate recovery system. 4,084,944, Cl. 55-27.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Chrismas, Alan Gould. Tile cutter. 4,084,569, Cl. 125-23.00R.
Christian, Robert L.: *See*—
Cole, Carroll R.; and Christian, Robert L., 4,084,335, Cl. 37-126.0AE.
Christophersen, Clarence E.; and Armstrong, Currie, to Rockwell Enterprises, Inc. Map vending machine. 4,084,724, Cl. 221-20.000.
Ciba-Geigy AG: *See*—
Beffa, Fabio; Buhler, Arthur; Donath, Peter; Schutz, Hans Ulrich; and Back, Gerhard, 4,085,097, Cl. 260-145.00A.

Gregory, Maurice James, 4,084,951, Cl. 71-86.000.
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,082, Cl. 260-31.600.
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,083, Cl. 260-31.600.

Ciba-Geigy Corporation: *See—*
Green, George Edward, 4,085,019, Cl. 204-159.230.
Park, Kyong P.; and Vellturo, Anthony F., 4,085,132, Cl. 560-75.000.

Citizen Watch Company Limited: *See—*
Watanabe, Kisuke; and Takasugi, Tsuneji, 4,084,990, Cl. 148-11.50R.

Claassen, Volkert: *See—*
Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,085,225, Cl. 424-304.000.

Claessens, Pierre L.: *See—*
Janjua, Mohammad Barakat Ilahi; Claessens, Pierre L.; and Loutfy, Raouf O., 4,085,016, Cl. 204-104.000.

Clancy, David: *See—*
Williams, Winfried Wilbur, Sr.; and Clancy, David, 4,084,391, Cl. 53-120.000.

Clare-Pendar Co.: *See—*
Weisenburger, Lawrence P., 4,085,394, Cl. 336-20.000.

Clark Equipment Company: *See—*
Wolfe, Robert W., 4,084,448, Cl. 74-475.000.

Clark, James A., to Bausch & Lomb Incorporated. Method and apparatus for lens turning. 4,084,459, Cl. 82-1.00C.

Cleare, Peter John Vernon, to Imperial Chemical Industries Limited. Preparation of halogenated aldehydes. 4,085,148, Cl. 260-601.00H.

Clem, Arthur G., to American Colloid Company. Method and composition for preventing water contaminated with industrial waste seeping through soil containing said water. 4,084,382, Cl. 61-36.00R.

Clements, Herbert Arthur, to S.S.S. Patents Limited. Rotary power transmission devices. 4,084,673, Cl. 192-67.00A.

Clow, Richard G. Coherent optical computer for polynomial evaluation. 4,084,880, Cl. 350-3.720.

Cluzel, Philippe Henri Maurice; and Quivy, Michel Georges, to Etat Francais. Underwater piezoelectric transducers. 4,085,400, Cl. 340-10.000.

CMI Corporation: *See—*
Gurries, Raymond A., 4,084,618, Cl. 137-625.480.
Petersik, Adolph R., 4,084,928, Cl. 425-64.000.

Cobb, Raymond L., to Phillips Petroleum Company. Ammonialytic cleavage of lactams to ω-aminonitriles. 4,085,130, Cl. 260-465.200.

Cohen, Leonard Selwyn: *See—*
Couch, Harold Thompson; Cohen, Leonard Selwyn; and Coulter, Lawrence Joseph, 4,084,781, Cl. 249-83.000.

Cole, Carroll R.; and Christian, Robert L., to Caterpillar Tractor Co. Bowl and ejector apparatus. 4,084,335, Cl. 37-126.0AE.

Cole, Carroll R.; Dezelan, Joseph E.; and Easterling, Gene B., to Caterpillar Tractor Co. Motor grader or the like with hydraulic control system for circle gear. 4,084,644, Cl. 172-796.000.

Coleman, Arthur A.: *See—*
Lomax, George F., Jr.; and Coleman, Arthur A., 4,085,173, Cl. 264-3.00R.

Colgate-Palmolive Company: *See—*
Giordano, Annie Sue; Burke, Richard Lerda; and Wixon, Harold Eugene, 4,085,243, Cl. 427-387.000.
Williams, Winfried Wilbur, Sr.; and Clancy, David, 4,084,391, Cl. 53-120.000.
Zmoda, Barney J., 4,084,939, Cl. 44-7.00C.

Collin, Per Harald; and Widell, Bjorn, to Stora Kopparbergs Bergslags Aktiebolag. Method of reducing finely grained material containing iron oxides in a fluid bed. 4,084,958, Cl. 75-36.000.

Collins, Donald L.: *See—*
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,084,713, Cl. 214-85.000.

Collins Industries, Inc.: *See—*
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,084,713, Cl. 214-85.000.

Columberg, Alfred, to Battelle Memorial Institute. Process for the preparation of an olefin-polymerization catalyst. 4,085,070, Cl. 252-429.00R.

Combey, Malcolm: *See—*
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,082, Cl. 260-31.600.
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,083, Cl. 260-31.600.

Communications Satellite Corporation: *See—*
Billerbeck, Wilfred Jerome; and Jacobus, Nelson Mortimer, Jr., 4,085,395, Cl. 336-61.000.
Standing, Arthur Frederick, 4,085,390, Cl. 333-33.000.

Compen, Johannes Maria Azalina Antonius, to U.S. Philips Corporation. Method of manufacturing a cathode-ray tube. 4,085,235, Cl. 427-64.000.

Compton, Richard B. Fish house. 4,084,597, Cl. 135-1.00R.

Computer Peripherals, Inc.: *See—*
Moss, James R., 4,084,683, Cl. 197-170.000.
Viswanathan, Lakshminarasimhan, 4,085,288, Cl. 178-69.100.

Concast AG: *See—*
Schmid, Markus, 4,084,628, Cl. 141-284.000.

Conrad, Raymond M.; and Whitcomb, Charles R. Collapsible guard rail. 4,084,277, Cl. 5-331.000.

Conroy, William E., to Caterpillar Tractor Co. Thrust washer arrangement for differentials. 4,084,450, Cl. 74-713.000.

Consolidated Products Corporation: *See—*
Roe, Norman P., 4,085,183, Cl. 264-174.000.

Construction Products Corporation: *See—*
Jones, David P., 4,084,828, Cl. 277-207.00A.

Constructions Metalliques de Provence: *See—*
Laignel, Raymond A.; and Mommeja, Patrick F., 4,084,608, Cl. 137-316.000.

Continental Can Company, Inc.: *See—*
Rosynek, John J.; and Patel, Anilkumar U., 4,084,722, Cl. 220-270.000.

Continental Can Company of Canada Ltd.: *See—*
Hughes, Robert G., 4,084,688, Cl. 206-188.000.

Continental Group, Inc., The: *See—*
Perry, Walter Merton, deceased, 4,084,721, Cl. 220-269.000.

Continental Oil Company: *See—*
Goodwin, Thomas E., 4,085,155, Cl. 260-668.00R.

Control Data Corporation: *See—*
Palm, William A.; and Young, Duane A., 4,085,383, Cl. 330-295.000.
Zenk, George Edward; Johnson, Robert Joseph; and Miller, Charles Newell, 4,085,302, Cl. 200-5.00A.

Controlex Corporation of America: *See—*
Wolf, John C.; and Costello, Thomas G., 4,084,409, Cl. 64-11.00B.

Cook, Donald W., to Cook Specialty Company. Furniture base and method of making the same. 4,084,776, Cl. 248-188.700.

Cook, Kenneth C., to Systron-Donner Corporation. Explosion discharge valve. 4,084,602, Cl. 137-68.00A.

Cook, Melvin A. Stable blasting slurry. 4,084,993, Cl. 149-39.000.

Cook Specialty Company: *See—*
Cook, Donald W., 4,084,776, Cl. 248-188.700.

Cooper, Duane H. Synthetic supplementary channel matrix decoding systems. 4,085,291, Cl. 179-1.0GQ.

Cooper, Hugh Melvin: *See—*
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,082, Cl. 260-31.600.
Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, 4,085,083, Cl. 260-31.600.

Copar Corporation: *See—*
Schmidt, Robert W., 4,084,539, Cl. 118-8.000.

Copes-Vulcan Inc.: *See—*
Butler, Robert Gerald, 4,085,438, Cl. 364-107.000.

Corlett, Ewan Christian Brew, to Hydroconic Limited. Roll damping tanks for ships and like vehicles. 4,084,534, Cl. 114-125.000.

Corman, Warren. Cigarette case with timer. 4,084,415, Cl. 70-269.000.

Corning, Bly A. Plastic molding apparatus. 4,084,931, Cl. 425-218.000.

Corning Glass Works: *See—*
Andrus, Ronald L.; and Reade, Richard F., 4,084,972, Cl. 106-39.700.
Andrus, Ronald L.; and Reade, Richard F., 4,084,973, Cl. 106-39.700.
Beall, George H.; and Rittler, Hermann L., 4,084,974, Cl. 106-39.700.

Cos, John Michael: *See—*
Burrell, Raymond Alexander; and Cos, John Michael, 4,085,212, Cl. 424-251.000.

Cosentino, Edward A. Process for preparing slabs of building materials. 4,085,181, Cl. 264-158.000.

Costello, Thomas G.: *See—*
Wolf, John C.; and Costello, Thomas G., 4,084,409, Cl. 64-11.00B.

Cosyns, Jean: *See—*
Juguin, Bernard; Cosyns, Jean; LePage, Jean-Francois; and Miquel, Jean, 4,085,157, Cl. 260-673.000.

Cota, Dennis, to Saba Schwarzwaelder Apparate-Bau-Anstalt August Schwer Soehne GmbH. Phase-comparison logic circuit for dual signal television reception. 4,085,424, Cl. 358-181.000.

Couch, Harold Thompson; Cohen, Leonard Selwyn; and Coulter, Lawrence Joseph, to United States of America, Navy. Fabrication of ablator liners in combustors. 4,084,781, Cl. 249-83.000.

Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, to U.S. Philips Corporation. Control device for electric heating systems of the bi-junction type for an apartment building. 4,085,310, Cl. 219-502.000.

Coulter, Lawrence Joseph: *See—*
Couch, Harold Thompson; Cohen, Leonard Selwyn; and Coulter, Lawrence Joseph, 4,084,781, Cl. 249-83.000.

Coursaut-Durand, Henri. Security closures. 4,084,719, Cl. 215-256.000.

Coussot, Pierre, to Societe d'Optique, Precision Electronique et Mecanique - SOPELEM. Microscope objective. 4,084,885, Cl. 350-175.0ML.

Coward, Michael D.; Dobinski, William J.; and Hinson, Rocose M., Jr., to Georgetown Steel Corporation. Shrouding apparatus. 4,084,799, Cl. 266-207.000.

Cox, William H.; and Wisdom, Norvell E., Jr., to Norton Company. Non-polluting waterproof cloth finish for abrasive cloth. 4,084,941, Cl. 51-295.000.

Coxhill, Major, to Allis-Chalmers Corporation. Gear and pinion backlash adjustment for the drive of a gyratory crusher. 4,084,756, Cl. 241-213.000.

CPC International Inc.: *See—*
Gibbons, John P.; and Chiang, Mutong T., 4,085,075, Cl. 260-17.200.
Gibbons, John P.; and Wondolowski, Lawrence, 4,085,076, Cl. 260-17.200.
Milkovich, Ralph; and Chiang, Mutong T., 4,085,168, Cl. 260-886.000.

CPL Corporation: *See—*
Rainer, William C., 4,085,186, Cl. 264-268.000.

Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William F., to Merck & Co., Inc. 6,7-Disubstituted-5-(acyl)benzofuran-2-carboxylic acids. 4,085,117, Cl. 260-332.20A.

Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., to Merck & Co., Inc. 9-Thia-, 9-oxothia-, and 9-dioxothia-11,12-seco-prostaglandins and processes. 4,085,125, Cl. 260-402.000.

Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Habecker, Charles N., to Merck & Co., Inc. Pyrazinecarboxamides and processes for preparing same. 4,085,211, Cl. 424-250.000.

Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., to Merck & Co., Inc. 1-Oxo-2,2-disubstituted-5-indanyloxy(or thio)alkanoic acids. 4,085,219, Cl. 424-269.000.

Creuzet, Robert Armand. Hot air aerostat. 4,084,771, Cl. 244-31.000.

Cromie, Harry W., to Baxter Travenol Laboratories, Inc. Machine having an improved take-up reel for winding hollow filaments. 4,084,758, Cl. 242-18.00G.

Croset, Michel; and Velasco, Gonzalo, to Thomson-CSF. Device for separating fluids and a method of manufacturing it. 4,085,048, Cl. 210-321.00R.

Crossley, Roger: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,110, Cl. 260-294.80B.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,215, Cl. 424-258.000.

Crowe, William P., to General Electric Company. Center hinge for top-mount, two-door refrigerator. 4,084,291, Cl. 16-170.000.

Crown Zellerbach Corporation: *See—*
Rucker, George I., 4,084,999, Cl. 156-466.000.

Cubic Tiltman Langley Limited: *See—*
Searle, Brian Christopher; and Ritter, Glenn Richard, 4,084,677, Cl. 194-100.00A.

Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., to Exxon Research & Engineering Co. Sorbent preparation and process using same. 4,085,195, Cl. 423-244.000.

Culpepper, Will Lester, to Mead Corporation, The. Article carrier. 4,084,693, Cl. 206-427.000.

Cumberland Packing Corporation: *See—*
Eisenstadt, Marvin E., 4,085,232, Cl. 426-548.000.

Cunningham, Douglas James, to Britax (Wingard) Limited. Sliding roof assembly. 4,084,848, Cl. 296-137.00E.

Cunningham, Hugh, to PPG Industries, Inc. Electrolysis cell liquor emission control process. 4,085,015, Cl. 204-98.000.

Curran, Adrian Charles Ward; and Shepherd, Robin Gerald, to John Wyeth & Brother Ltd. Silicon derivatives of tetrahydroquinolines. 4,085,108, Cl. 260-283.0SC.

Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother, Ltd. 1,2,3,5,6,7-Hexahydrodicyclopenta[b,e]pyridine derivatives. 4,085,110, Cl. 260-294.80B.

Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Ltd. Certain 5,6,7,8-tetrahydroquinoline-8-thiocarboxamides. 4,085,215, Cl. 424-258.000.

Custom-Bilt: *See—*
Murphy, Milo E., 4,084,658, Cl. 181-241.000.

Cutler, Royal A.: *See—*
Diana, Guy D.; and Cutler, Royal A., 4,085,144, Cl. 260-584.00R.

Cybernet Electronic Corporation: *See—*
Kakigi, Takao, 4,085,364, Cl. 325-20.000.

Dahlberg, John R.: *See—*
Gorman, Harold R.; Dahlberg, John R.; and Oravitz, James L., Jr., 4,084,737, Cl. 225-2.000.

Dai Nippon Toryo Co., Ltd.: *See—*
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.

Daicel Ltd.: *See—*
Takahashi, Katuhiko; Arimoto, Kyozo; Arai, Yoshiyuki; Morinaga, Tsuyoshi; and Nakazawa, Yuji, 4,085,274, Cl. 560-176.000.

Daimler-Benz Aktiengesellschaft: *See—*
Kurrat, Klaus, 4,084,667, Cl. 188-275.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Ariga, Nagao; Nanbu, Junji; and Oikawa, Hiroshi, 4,085,018, Cl. 204-159.150.
Mizuno, Shioji; Ishikawa, Ryoichi; and Miyazaki, Mitsumasa, 4,085,086, Cl. 260-40.0TN.

Dalton, Thomas B., to Westran Corporation. Valve actuator. 4,084,447, Cl. 74-89.140.

Daniel, James A., Jr.; and Hubbard, John T., Jr. Levelling and stabilization system for a vehicle. 4,084,830, Cl. 280-6.100.

Daniel, William H. Simulated deadlock for doors. 4,084,417, Cl. 70-431.000.

Data General Corporation: *See—*
Dunn, David, 4,085,427, Cl. 360-77.000.

Dumiller, Guenther; Merkel, Karl; Neumayr, Franz; and Schneider, Kurt, to BASF Aktiengesellschaft. 1,3,5 Tris-(2-chloroformyl-oxyethyl)-isocyanurate. 4,085,269, Cl. 544-221.000.

Dauvergne, Michel: *See—*
Karinthi, Pierre; Dauvergne, Michel; and Hirschauer, Benoit, 4,085,252, Cl. 428-576.000.

David Brown Tractors Limited: *See—*
Ashfield, Herbert Edward; and Horsfall, Harry, 4,084,641, Cl. 172-9.000.

Davies, David Huw: *See—*
Mallams, Alan K.; and Davies, David Huw, 4,085,208, Cl. 424-180.000.

Davison, Sol: *See—*
Gergen, William P.; and Davison, Sol, 4,085,163, Cl. 260-857.00D.

Davydov, Vladimir Nikolaevich: *See—*
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.

Dawans, Francois: *See—*
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,085,055, Cl. 252-50.000.

Day, Leon E., to Polygon, Inc. Socket head tool. 4,084,454, Cl. 81-121.00R.

Dayton Sure-Grip & Shore Company, The: *See—*
Mess, Richard C., 4,084,780, Cl. 249-59.000.

De Laval Separator Company, The: *See—*
Fett, Richard H. G., 4,084,750, Cl. 239-600.000.

Dearling, Harry S. Direct and indirect fragrance dispensing device. 4,084,732, Cl. 222-402.170.

Debruijn, Henricus Antonius: *See—*
Lippits, Gerardus Johannes Meinardus; Janssen, Petrus Johannes; Debruijn, Henricus Antonius; and van Ruler, Johannes, 4,085,285, Cl. 174-68.500.

Deere & Company: *See—*
Robinson, Michael, 4,084,962, Cl. 75-130.00A.

Deetz, David R., to Xerox Corporation. Enhanced underscoring methods and means for automatic typewriter and the like employing hammer-type impact printing mechanism. 4,084,680, Cl. 197-19.000.

de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Diaphragm clutch assembly. 4,084,674, Cl. 192-89.00B.

Deggendorfer Werft und Eisenbau G.m.b.H.: *See—*
Hellmich, Gerhard, 4,084,527, Cl. 114-36.000.

Deinzer, Michael: *See—*
Grave, Burghard; Gutbier, Heinrich; and Deinzer, Michael, 4,085,255, Cl. 429-26.000.

Deitz, Paul H.; Durfee, Gary L.; and Wolff, Stephen S., to United States of America, Army. Spatial-multiplex, spatial-diversity optical communication scheme. 4,085,319, Cl. 250-199.000.

de Koning, Jan: *See—*
Wolters, Tjako Aaldrik; and de Koning, Jan, 4,084,334, Cl. 37-67.000.

Del Vecchio, Oscar. Footwear inner sole. 4,084,333, Cl. 36-43.000.

DeMaria, Anthony J.: *See—*
Gilden, Meyer; Reeder, Thomas M.; and DeMaria, Anthony J., 4,085,388, Cl. 331-107.00A.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Den Otter, Marinus J. A. M.; Van Geenen, Albert A.; and Te Nijenhuis, Anne, to Stamicarbon, B.V. Phosphonate-isocyanurates. 4,085,283, Cl. 544-214.000.

dePolo, Harry Rudolph. Umbrella. 4,084,600, Cl. 135-20.00R.

De Ronde, Frans Christiaan: *See—*
Schiek, Burkhard; and De Ronde, Frans Christiaan, 4,085,391, Cl. 333-33.000.

Derrien, Robert F., to Societe Hure S A. Machine tools having a rotating spindle such as milling machines. 4,084,482, Cl. 90-11.00R.

Designeers Midwest, Division Maswill Industries Incorporated: *See—*
Albers, Norbert C., 4,084,727, Cl. 221-298.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,085,020, Cl. 204-181.00C.
Sekmakas, Kazys; and Shah, Raj, 4,085,161, Cl. 260-837.00R.

Desplats, Andre; and Cavalieri, Michel, to Tractel S.A. Clutch control device for cable traction apparatus. 4,084,788, Cl. 254-76.000.

Detty, Garnett E. Knee sleeve. 4,084,584, Cl. 128-80.00C.

Deuring, Hans: *See—*
Vossieck, Paul; and Deuring, Hans, 4,084,826, Cl. 277-134.000.

De Vito, Michael G.; and Wieloch, Francis J., to Xerox Corporation. Transparencies for color xerographic copies. 4,085,245, Cl. 428-215.000.

DeWitt, David A., to Ames Safety Envelope Company. Flexible paper fastener. 4,084,911, Cl. 402-15.000.

Dewsnap, Ronald F.; Higgins, Andrew D.; and Beard, David E., to British Steel Corporation. Cooling systems for metal articles. 4,084,798, Cl. 266-131.000.

Dexter Corporation, The: *See—*
Biggins, Walter F., 4,084,949, Cl. 55-524.000.

Dey, Arabinda N., to P. R. Mallory & Co. Inc. High temperature organic electrolyte cells. 4,085,256, Cl. 429-48.000.

Dezelan, Joseph E.: *See—*
Cole, Carroll R.; Dezelan, Joseph E.; and Easterling, Gene B., 4,084,644, Cl. 172-796.000.

Deziel, Frederick T., to Honeywell Inc. Safe start checking liquid processing system. 4,084,547, Cl. 122-504.000.

Diamond Shamrock Corporation: *See—*
Bennett, John E.; and Elliott, Joseph E., 4,085,014, Cl. 204-95.000.

Diana, Guy D.; and Cutler, Royal A., to Sterling Drug Inc. N,N'-Bridged-bis(2-alkyl-2-hydroxyethylamine) dioxides. 4,085,144, Cl. 260-584.00R.

Diaz, Stephen Hunter: *See—*
Horsma, David August; and Diaz, Stephen Hunter, 4,085,286, Cl. 174-92.000.
Didier Engineering GmbH: *See—*
Fach, Horst, 4,084,712, Cl. 214-35.00R.
Diehl, Francis Louvaine: *See—*
Murphy, Alan Pearce; Seiden, Paul; Diehl, Francis Louvaine; and McCarty, Charles Bruce, 4,085,052, Cl. 252-8.600.
Diehl, Karl-Heinz: *See—*
Sandermann, Wilhelm; Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,085,220, Cl. 424-274.000.
Dietz, Henry G. Liquid flow switch. 4,085,305, Cl. 200-83.00A.
DiLeone, Roland Ralph; and Robustelli, Albert George, to American Cyanamid Company. Impact resistant acrylic polymer composition. 4,085,166, Cl. 260-876.00R.
Dinger, Leon Joel, to AMP Incorporated. Electrical connector. 4,084,876, Cl. 339-95.00D.
Discwasher, Inc.: *See—*
Maier, Bruce R., 4,084,540, Cl. 118,48.000.
Dittloff, Dieter: *See—*
Herbold, Oskar; and Dittloff, Dieter, 4,084,521, Cl. 110-242.000.
Dittrich, Erich; and Grone, Siegfried, to Thyssen Industrie AG. Method for manufacturing annular metal workpieces. 4,084,419, Cl. 72-68.000.
Dixon, Rolland E.; and Hann, P. Douglas, to Phillips Petroleum Company. Isoamylenes from butenes. 4,085,158, Cl. 260-680.00E.
Dobinski, William J.: *See—*
Coward, Michael D.; Dobinski, William J.; and Hinson, Rocose M., Jr., 4,084,799, Cl. 266-207.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Dorsch, Heinz, 4,084,565, Cl. 123-140.0MP.
Doherty, Thomas E., to Owens-Illinois, Inc. Container bottom cutting apparatus and method. 4,084,490, Cl. 93-55.10R.
Dohrendorf, Franz, to Nordischer Maschinenbau Rud. Baader. Fish processing machine. 4,084,294, Cl. 17-57.000.
Dominguez, Richard Lee. Protective pad for musical instruments. 4,084,477, Cl. 84-327.000.
Dominguez, Richard Lee. Bracket for supporting stringed musical instruments. 4,084,778, Cl. 248-314.000.
Donath, Peter: *See—*
Beffa, Fabio; Buhler, Arthur; Donath, Peter; Schutz, Hans Ulrich; and Back, Gerhard, 4,085,097, Cl. 260-145.00A.
Dorsch, Heinz, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Combustion air supply apparatus for an internal combustion engine. 4,084,565, Cl. 123-140.0MP.
Dow Chemical Company, The: *See—*
Anderson, Thomas F.; and Hartless, Arlington L., 4,085,160, Cl. 260-837.00R.
McKendry, Lennon H., 4,085,278, Cl. 544-111.000.
McKendry, Lennon H., 4,085,279, Cl. 544-111.000.
Pierce, James K., 4,085,281, Cl. 544-185.000.
Schneider, John A.; and Mills, Jack F., 4,085,153, Cl. 260-649.00R.
Suh, Kyung W.; and Killingbeck, Graydon Wayne, 4,085,073, Cl. 260-2.50E.
Downing, Harold A.: *See—*
Rohrs, Donald L.; Downing, Harold A.; and Collins, Donald L., 4,084,713, Cl. 214-85.000.
Doyle, William C., Jr.; and Botts, Marion F., to Gulf Oil Corporation. Barban formulation. 4,084,956, Cl. 71-111.000.
Dragan, William Basil. Face bow. 4,084,319, Cl. 32-21.000.
Dragisic, Joseph, to Bunker Ramo Corporation. Apparatus for stripping and positioning an insulation conductor. 4,084,310, Cl. 29-564.400.
Drew, Allan Mathieson: *See—*
Jones, Ralph Archibald; and Drew, Allan Mathieson, 4,085,290, Cl. 179-1.0CN.
Drews, Ulrich; Werner, Peter; and Winkelmann, Lothar, to Robert Bosch GmbH. Method and apparatus for fuel injection control. 4,084,552, Cl. 123-32.0EA.
Drori, Mordeki. Flow reducing devices particularly useful as drip emitters for drip irrigation. 4,084,749, Cl. 239-271.000.
Dubois, Jacques E.; and Miller, John A., to Agence Nationale de Valorisation de la Recherche. Keyboard operated apparatus for simultaneous coding and display of chemical structure and similar graphical information. 4,085,443, Cl. 364-900.000.
Dubovik, Alexandr Ivanovich: *See—*
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.
Dudek, Harold M., to Astro Development Corporation. Partially fluid lacked vehicle drive train. 4,084,654, Cl. 180-44.00R.
Duffy, Richard Joseph: *See—*
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, 4,085,045, Cl. 210-58.000.
Dugas, Clet. Sugar cane planter. 4,084,465, Cl. 83-103.000.
Duncan, William W., Sr. Detachable, self-dumping, self-retracting cargo bin for pickup trucks. 4,084,851, Cl. 298-14.000.
Dunchock, Richard S., to Optarac Corporation. Display rack. 4,084,700, Cl. 211-41.000.
Dunlap, Bill D., to KB-Denver, Inc. Keyboard switch assemblies. 4,085,306, Cl. 200-275.000.
Dunn, David, to Data General Corporation. Transducer positioning system. 4,085,427, Cl. 360-77.000.
Dunn, Wendell E., Jr. Process for recycle beneficiation of titaniferous ores. 4,085,189, Cl. 423-74.000.
Du Pont de Nemours, E. I., and Company: *See—*
Atkins, Thomas Joseph, 4,085,106, Cl. 260-256.40F.
Booy, Max Lorenz, 4,085,462, Cl. 366-174.000.
Buser, Kenneth Rene; Roedel, Milton John; and Vassiliou, Eustathios, 4,085,246, Cl. 428-220.000.
Frazer, August Henry, 4,085,091, Cl. 260-75.00R.
Goodrich, Lewis Charles; Holt, Theron Robert; Osborne, Joseph Cyril; Pusey, Donald Kirk; and Roxlo, James William, 4,084,434, Cl. 73-160.000.
Resnick, Paul Raphael; and Grot, Walther Gustav, 4,085,071, Cl. 260-22.00R.
Reynolds, James K., 4,084,952, Cl. 71-86.000.
Witt, Alan Caywood, 4,084,767, Cl. 242-164.000.
Zak, Dennis Joseph, 4,085,151, Cl. 260-635.00Y.
Duraiswamy, Kandaswamy: *See—*
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; Knell, Everett W.; Mirza, Zia I.; and Winter, Bruce L., 4,085,030, Cl. 208-8.000.
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, to Institut Francais du Petrole; and Rhone Poulenc Industries. Grafted copolymers and their use as additives for lubricating oils. 4,085,055, Cl. 252-50.000.
Durfee, Gary L.: *See—*
Deitz, Paul H.; Durfee, Gary L.; and Wolff, Stephen S., 4,085,319, Cl. 250-199.000.
Dwivedi, Basant K.: *See—*
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,085,227, Cl. 426-3.000.
Dworkin, Robert Dally; and Ejik, Adam Joseph, to M&T Chemicals Inc. Method for stabilizing vinyl chloride polymers. 4,085,077, Cl. 260-23.0XA.
Dynapar Corporation: *See—*
Smith, Lee H.; and Alexandrowicz, Norman J., 4,084,675, Cl. 192-95.000.
Dyno Industrier A.S.: *See—*
Nielsen, Tore Bernt; and Alm, Oddvar, 4,084,994, Cl. 149-44.000.
Samuelsen, Eirik; and Alm, Oddvar, 4,084,995, Cl. 149-56.000.
E. F. Johnson Company: *See—*
Wahi, Chander Mohan, 4,084,878, Cl. 339-99.00R.
E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Turk, Chester Frank, 4,085,102, Cl. 542-450.000.
Krapcho, John; and Turk, Chester F., 4,085,280, Cl. 544-140.000.
Turk, Chester F.; and Krapcho, John, 4,085,142, Cl. 260-570.5CA.
Ear, Frank P. Filter apparatus for fast food kitchens exhaust. 4,084,947, Cl. 55-242.000.
Early California Industries, Inc.: *See—*
Howard, Charles W., 4,084,603, Cl. 137-88.000.
Easterling, Gene B.: *See—*
Cole, Carroll R.; Dezelan, Joseph E.; and Easterling, Gene B., 4,084,644, Cl. 172-796.000.
Easterling, Gene Baptist, to Caterpillar Tractor Co. Motor grader with blade support structure. 4,084,643, Cl. 172-795.000.
Eastman, Jay Morgan; and Refermat, Stanley J., to University of Rochester, The. Reflective polarization retarder and laser apparatus utilizing same. 4,084,883, Cl. 350-152.000.
Eastman Kodak Company: *See—*
Holmes, Jerry D., 4,085,143, Cl. 260-515.00R.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,085,089, Cl. 260-45.8NT.
O'Brien, David Frank, 4,084,967, Cl. 96-29.00R.
Wenthe, Stephen James; and Caswell, David Arlen, 4,084,806, Cl. 271-80.000.
Ebauches S.A.: *See—*
Wiget, Fridolin, 4,084,404, Cl. 58-50.00R.
Eckel, Emery Lee, to Eckel Manufacturing Co., Inc. Power tongs. 4,084,453, Cl. 81-57.180.
Eckel Manufacturing Co., Inc.: *See—*
Eckel, Emery Lee, 4,084,453, Cl. 81-57.180.
Eckert, Konrad, to Robert Bosch GmbH. Fuel metering device. 4,084,562, Cl. 123-119.0EC.
Eckert, Robert L. Security lock for emergency door latch mechanism. 4,084,845, Cl. 292-92.000.
Ecodyne Corporation: *See—*
Chirico, Anthony N., 4,084,945, Cl. 55-38.000.
Chirico, Anthony Nicholas, 4,084,944, Cl. 55-27.000.
Eddens, Gerald R., to W. J. Industries, Inc. Cooling for magnetic particle devices. 4,085,344, Cl. 310-58.000.
Edison, David M.: *See—*
Quan, Wing C.; Edison, David M.; Hummert, George T.; and Sackin, Milton, 4,084,661, Cl. 187-29.00R.
Egan, John J., to Bauer Bros. Co., The. Front feed static screen. 4,085,040, Cl. 209-244.000.
Eggensperger, Heinz: *See—*
Sandermann, Wilhelm; Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,085,220, Cl. 424-274.000.
Egnaczak, Raymond K.: *See—*
Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 4,084,896, Cl. 355-3.00P.
Ehernberger, John E.; and Mazza, Bud, to G.B.C., Inc. Method and

apparatus for crushing and separating metallic containers. 4,084,496, Cl. 100-35.000.

Eichholz, Werner; and Krebs, Gerd, to Phoenix Gummiwerke AG. Device for gripping, pressing and depositing tire cores. 4,084,998, Cl. 156-403.000.

Eichler, Horst. Flank drive for planing hull and displacement craft. 4,084,537, Cl. 115-50.000.

Eisai Co., Ltd.: *See—*
Takebe, Toshio; and Yamazaki, Takashi, 4,084,591, Cl. 128-285.000.

Eisenstadt, Marvin E., to Cumberland Packing Corporation. Neohesperidine dihydrochalcone sweetening compositions. 4,085,232, Cl. 426-548.000.

Ejk, Adam Joseph: *See—*
Dworkin, Robert Dally; and Ejk, Adam Joseph, 4,085,077, Cl. 260-23.0XA.

Ekman, Bror Fridolf Thure. Fluid coupling device. 4,084,614, Cl. 137-614.030.

Elbert, Donald Lee, to Monsanto Company. Nylon composition containing non-polar ester plasticizer. 4,085,080, Cl. 260-31.20N.

Electric Power Research Institute, Inc.: *See—*
Glenn, Robert G., 4,084,922, Cl. 416-220.00R.

Electricity Council, The: *See—*
Simpson, David Preston; and Lawton, James, 4,085,170, Cl. 261-1.000.

Electro-Chlor Corporation: *See—*
McCallum, John, 4,085,028, Cl. 204-269.000.

Elfers, Gunther Hans: *See—*
Otrhalek, Joseph V.; Gomes, Gilbert Stephen; and Elfers, Gunther Hans, 4,085,000, Cl. 162-16.000.

Eli Lilly and Company: *See—*
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,085,224, Cl. 424-283.000.

Elliott, Joseph E.: *See—*
Bennett, John E.; and Elliott, Joseph E., 4,085,014, Cl. 204-95.000.

Ellis, Norbert E., to Met-Pro Systems, Inc. Carbon contact column. 4,085,043, Cl. 210-40.000.

Emerson Electric Co.: *See—*
Yagher, Charles, Jr., 4,085,397, Cl. 337-407.000.

Emmerich, Kenneth C.; and Hamlin, Ralston L., to Fansteel Inc. Self-retaining sleeve and bit. 4,084,856, Cl. 299-86.000.

Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Chiyoda Chemical Engineering & Construction Co., Ltd. Method for the thermal cracking of heavy hydrocarbon. 4,085,034, Cl. 208-48.00R.

Engel, Stephen August; and Fuhrhop, Ronald Elmer, to Union Carbide Corporation. Method and apparatus for making instantaneous scarfing cuts. 4,084,988, Cl. 148-9.500.

Engineered Systems, Inc.: *See—*
Van Ness, Bradford O., 4,085,313, Cl. 235-419.000.

Engle, Thomas H., to General Signal Corporation. Uncoupling valve with override feature. 4,084,858, Cl. 303-18.000.

Environetics, Inc.: *See—*
Winters, Raymond S., 4,084,358, Cl. 52-4.000.

Epple, Richard R., to Maryland Cup Corporation. Dispensing valve. 4,084,729, Cl. 222-307.000.

Erfurth, Henning: *See—*
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, 4,084,984, Cl. 106-300.000.

Erneta, Modesto, to N L Industries, Inc. Hydrochlorination of spray dried magnesium chloride. 4,085,198, Cl. 423-498.000.

Ernst, Heinz-Hubert, to Metallgesellschaft Aktiengesellschaft. Process for producing shaped bodies. 4,084,957, Cl. 75-3.000.

Erwin, Arthur F. Contra-rotating vibrator. 4,084,445, Cl. 74-61.000.

Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik: *See—*
Sick, Erwin, 4,085,322, Cl. 250-227.000.

Esseluhn, Werner F., to Western Electric Co., Inc. Methods of and apparatus for sorting parts of a separated article. 4,085,038, Cl. 209-71.000.

Etablissements CARPANO & PONS: *See—*
Bullat, Jean, 4,085,345, Cl. 310-117.000.

Etat Francais: *See—*
Cluzel, Philippe Henri Maurice; and Quivy, Michel Georges, 4,085,400, Cl. 340-10.000.

Ethicon, Inc.: *See—*
Bilweis, Joseph, 4,084,692, Cl. 206-403.000.

Etnaer, Alexandr Ivanovich: *See—*
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.

Eumuco Aktiengesellschaft fur Maschinenbau: *See—*
Willenbrock, Walter; and Winkler, Helmut, 4,084,418, Cl. 72-31.000.

Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Method for producing solar energy panels by automation. 4,084,985, Cl. 136-89.00P.

Evans, Robert, to Stone-Platt Crawley Limited. Check synchronism. 4,085,362, Cl. 324-83.00D.

Evans Rotork, Inc.: *See—*
Salamone, Saverio, 4,084,645, Cl. 173-13.000.

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Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,085,141, Cl. 260-570.00R.

EVVA Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft: *See—*
Prunbauer, Kurt, 4,084,416, Cl. 70-276.000.

Exxon Research & Engineering Co.: *See—*
Aczel, Thomas; and Plumlee, Karl W., 4,085,032, Cl. 208-10.000.
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 4,085,195, Cl. 423-244.000.
Plumlee, Karl W., 4,085,033, Cl. 208-10.000.
Van Auken, Richard L., 4,084,819, Cl. 273-80.00R.
Walchuk, George P., 4,085,031, Cl. 208-8.000.
Whitney, Thomas A., 4,085,138, Cl. 260-563.00R.
Wristers, Harry J., 4,085,064, Cl. 252-429.00B.
Wristers, Jos, 4,085,035, Cl. 208-143.000.

Ezaki, Masatsugu. Food processing device. 4,084,494, Cl. 99-450.700.

Fa. J. N. Eberle & Cie. GmbH: *See—*
Mogerlein, Heinrich; and Moser, Werner, 4,084,764, Cl. 242-107.000.

Fach, Horst, to Didier Engineering GmbH. Charging truck for feeding coal into horizontal-chamber coke-ovens. 4,084,712, Cl. 214-35.00R.

Fagan, John L., to Westinghouse Electric Corporation. Monolithic implementation of a fast Fourier transform. 4,085,441, Cl. 364-827.000.

Fagert, Russell Bruce; and Fogle, John Louis, to Rockwell International Corporation. Leakage drain for single lever control valve. 4,084,607, Cl. 137-312.000.

Fairchild Camera and Instrument Corporation: *See—*
Smith, Ronald A., 4,085,301, Cl. 200-4.000.

Fairey, Brian M.; and Plasschaert, Paulus E., to NCR Canada Ltd. - NCR Canada Ltee. Inked ribbon guide member with tracking surfaces thereon. 4,084,682, Cl. 197-168.000.

Falchle, Jorg; and Hahner, Reinhard, to Robert Bosch GmbH. Force-transmitting arrangement for hammer drills. 4,084,829, Cl. 279-99.000.

Falkingham, Clarence Mark: *See—*
Caraway, William Russell; and Falkingham, Clarence Mark, 4,084,590, Cl. 128-283.000.

Fansteel Inc.: *See—*
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,084,856, Cl. 299-86.000.
Fry, Stanley S., 4,084,965, Cl. 75-230.000.

Farafontov, Vladimir Ivanovich; Kalashnikov, Yaroslav Alexeevich; Novikov, Jury Nikolaevich; Volpin, Mark Efimovich; Vereschagin, Leonid Fedorovich; and Lysanov, Vladislav Sergeevich. Process for producing synthetic diamonds. 4,085,196, Cl. 423-446.000.

Farish, Owen; and Hundstad, Richard L., to Westinghouse Electric Corporation. Independent initiation technique of glow discharge production in high-pressure gas laser cavities. 4,085,386, Cl. 331-94.5PE.

Farrell, John H., to Houdaille Industries, Inc. Shape grinder and method. 4,084,349, Cl. 51-5.00D.

Farstad, Johan T., to IRD Mechanalysis, Inc. Piezo electric transducer for measuring instantaneous vibration velocity. 4,085,349, Cl. 310-319.000.

Faust, William D., to Ferro Corporation. Volatilizable frit composition forming oxidation-inhibiting vapors. 4,084,975, Cl. 106-48.000.

Fedders Corporation: *See—*
Brenneman, Daniel A., 4,084,406, Cl. 62-211.000.

Feder, Emil. Line cleats for securing ropes, but especially for lines to sails of sailboats. 4,084,532, Cl. 114-218.000.

Fedorov, Igor Konstantinovich: *See—*
Rakitin, Vladimir Jurievich; Fedorov, Igor Konstantinovich; Grigorian, Alfred Nikitovich; Lalov, Vitaly Viktorovich; and Prokofieva, Nina Vasilievna, 4,084,757, Cl. 241-301.000.

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Fekete, Lajos F.: *See—*
Bick, Rodger L.; and Fekete, Lajos F., 4,085,095, Cl. 260-112.00B.

Felt Products Mfg. Co.: *See—*
Pyle, Lawrence F.; and Brady, John F., 4,084,912, Cl. 404-74.000.

Fenrick, Walter J.: *See—*
Carpenter, Wilfred C.; Schmitz, Gary N.; and Fenrick, Walter J., 4,084,440, Cl. 73-422.0GC.

Ferag AG: *See—*
Reist, Walter; and Honegger, Werner, 4,084,808, Cl. 271-213.000.

Ferro Corporation: *See—*
Faust, William D., 4,084,975, Cl. 106-48.000.
van der Vliet, William Ewald, 4,085,021, Cl. 204-181.00N.

Fett, Richard H. G., to De Laval Separator Company, The. Nozzle assembly for filters. 4,084,750, Cl. 239-600.000.

Fettel, Bruce E.: *See—*
Ionescu, Marian I.; and Fettel, Bruce E., 4,084,268, Cl. 3-1.500.

Fichot, Bernard: *See—*
Lainez, Lucien; Fichot, Bernard; and Bijon, Jean-Paul, 4,084,694, Cl. 206-444.000.

Figge, Erwin E.: *See—*
Bagby, John P.; Figge, Erwin E.; and Kim, Raymond W. H., 4,084,892, Cl. 352-29.000.

Filtrol Corporation: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,085,069, Cl. 252-455.00Z.

Finike Italiana Marposs Soc. In. Accomandita Semplice di Mario Possati & C.: *See—*
Albertazzi, Gastone, 4,084,322, Cl. 33-174.00L.

Finnegan, Francis, to Texas Instruments Incorporated. Thermocouple circuit. 4,084,437, Cl. 73-361.000.
Fiori, Lee B.: *See*—
Schweitzer, Roy C.; and Fiori, Lee B., 4,084,510, Cl. 101-365.000.
Firmenich & Cie: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,085,109, Cl. 260-294.80E.
Firminhac, Ralph H.: *See*—
Marceau, J. Arthur; Firminhac, Ralph H.; and Moji, Yukimori, 4,085,012, Cl. 204-38.00A.
Fisher-Cornelssen, Kurt Anton, to Sandoz Ltd. Elevating mood in geriatric patients. 4,085,218, Cl. 424-267.000.
Fisons Limited: *See*—
Augstein, Joachim; Cairns, Hugh; and Rogers, Norman Harold, 4,085,115, Cl. 260-308.00D.
Flament, Ivon: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,085,109, Cl. 260-294.80E.
Flanagan, Joseph E.; and Frankel, Milton B., to Rockwell International Corporation. 1,3-Diazido-2-nitrazapropane. 4,085,123, Cl. 260-349.000.
Flandorfer, Robert, to Braun Aktiengesellschaft. Exposure control for motion picture cameras. 4,084,893, Cl. 352-141.000.
Flannery, Matt W. Continuous tension exerciser. 4,084,815, Cl. 272-119.000.
Fleck, Fritz: *See*—
Mercer, Alec Victor; Littlewood, Peter Stuart; Bolton, Ivan Joseph; and Fleck, Fritz, 4,085,101, Cl. 260-239.900.
Fleming, Gary L.: *See*—
Fritz, David P.; Weigand, Rex O.; and Fleming, Gary L., 4,084,396, Cl. 56-98.000.
FMC Corporation: *See*—
Fullerton, Donald Griswold; Kyrias, Gilbert Mowder; and Weber, Richard Baxter, 4,085,041, Cl. 210-7.000.
Focke, Heinz, to Focke & Pfuhl. Apparatus for making and filling hinged boxes of a foldable material. 4,084,393, Cl. 53-137.000.
Focke, Heinz; and Balmer, Oskar, to Focke & Pfuhl. Method of and apparatus for dispensing tobacco portions. 4,084,627, Cl. 141-11.000.
Focke & Pfuhl: *See*—
Focke, Heinz, 4,084,393, Cl. 53-137.000.
Focke, Heinz; and Balmer, Oskar, 4,084,627, Cl. 141-11.000.
Fogle, John Louis: *See*—
Fagert, Russell Bruce; and Fogle, John Louis, 4,084,607, Cl. 137-312.000.
Foglio, Maurizio; Scarponi, Ugo; and Arcamone, Federico, to Societa' Farmaceutici Italia S.p.A. Process for the preparation of azetidinone-thiazoline precursors for cephalosporin synthesis. 4,085,113, Cl. 260-306.70C.
Fohl, Artur. Closure for safety belts. 4,084,298, Cl. 24-230.0AL.
Fokker-VFW B. V.: *See*—
Godfried, Leo M., 4,085,247, Cl. 428-290.000.
Fondation Cum Plate: *See*—
von Platen, Baltzar, 4,084,408, Cl. 62-467.00R.
Fontana, Pietro: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,085,122, Cl. 260-346.750.
Food Machinery Espanola, S.A.: *See*—
Sanchez de Leon Rodriquez-Roda, D. Juan Antonio, 4,084,697, Cl. 209-106.000.
Ford Motor Company: *See*—
Labana, Santokh S.; and Chang, Yun Feng, 4,085,260, Cl. 526-16.000.
vor der Bruck, Rolf; and Voll, Walter, 4,084,838, Cl. 280-715.000.
Forde, Diane: *See*—
Forde, Louis; and Forde, Diane, 4,084,553, Cl. 123-48.00B.
Forde, Louis; and Forde, Diane. Piston and rod assembly with displacement features. 4,084,553, Cl. 123-48.00B.
Forsman, Lars Osten. Energy absorbing unit for physical exercising devices. 4,084,810, Cl. 272-73.000.
Foster Cathead Corporation: *See*—
Boland, John Gordon, 4,084,429, Cl. 73-139.000.
Fradella, Richard B. Variable-speed regenerative brushless electric motor and controller system. 4,085,355, Cl. 318-168.000.
Francis, John Frederick, to Gillette Company, The. Safety razors. 4,084,316, Cl. 30-47.000.
Francis, Melvin A., to Industrial Drives, Inc. Stabilizing jack. 4,084,789, Cl. 254-86.00R.
Frank J. Zamboni & Co.: *See*—
Zamboni, Frank J., 4,084,763, Cl. 242-86.520.
Franke, Rainer-Burkhard; Hirschmann, Adolf; and Kaser, Klaus, to Labora Mannheim GmbH fur Labortechnik. Measuring and pipetting device. 4,084,730, Cl. 222-309.000.
Frankel, Milton B.: *See*—
Flanagan, Joseph E.; and Frankel, Milton B., 4,085,123, Cl. 260-349.000.
Franssen, Nico Valentinus, to U.S. Philips Corporation. Circuit arrangement for obtaining a chorus effect. 4,084,471, Cl. 84-1.010.
Franz, John E., to Monsanto Company. N-hydroxy-N-phosphonomethylglycines and the herbicidal use thereof. 4,084,953, Cl. 71-86.000.
Franz, Norman C. Additive metering system using a centrifugal pump. 4,084,605, Cl. 137-101.110.
Fraser, Douglas S., to FTS Systems, Inc. Flask for freeze drying with adjustable seal. 4,084,330, Cl. 34-92.000.
Fray, Derek John, to National Research Development Corporation. Apparatus for detecting elements. 4,085,023, Cl. 204-195.00S.
Frazer, August Henry, to Du Pont de Nemours, E. I., and Company. Thermally stable, rigid polyesters from thermally stable, rigid dibasic acids and aromatic dihydroxy compounds. 4,085,091, Cl. 260-75.00R.
Freedman, Clive M., to TBA Industrial Products Limited. Glass and refractory fibre materials and method for making same. 4,084,977, Cl. 106-50.000.
Fridkin, Matityahu: *See*—
Patchornik, Avraham; Warshawsky, Abraham; Fridkin, Matityahu; and Kalir, Rami, 4,085,261, Cl. 526-19.000.
Frier, David Lee, to Bankers Trust of South Carolina. Currency drop safe. 4,084,520, Cl. 109-56.000.
Frilette, Vincent J.; and Rubin, Mae K., to Mobil Oil Corporation. Conversion of hydrocarbons. 4,085,156, Cl. 260-671.00R.
Fritz, David P.; Weigand, Rex O.; and Fleming, Gary L., to Hesston Corporation. Adjustable row spacing forage head. 4,084,396, Cl. 56-98.000.
Frohlich, Alfons; and Hochlehnert, Franz, to OPTI Patent- Forschungs- und Fabrikations-AG. Slide fastener. 4,084,297, Cl. 24-205.13C.
Frost Packaging Company: *See*—
Thurston, Benjamin L., 4,084,720, Cl. 220-76.000.
Fruh, Ernst Josef, to Iminex GmbH. Apparatus for the preparation of insulating material. 4,084,753, Cl. 241-34.000.
Fry, Stanley S., to Fansteel Inc. Columbium powder and method of making the same. 4,084,965, Cl. 75-230.000.
Frye, Bennie W.: *See*—
Bradley, W. L.; Frye, Bennie W.; and Raines, Joseph W., 4,084,657, Cl. 180-114.000.
FTS Systems, Inc.: *See*—
Fraser, Douglas S., 4,084,330, Cl. 34-92.000.
Fuchs, Alvin J., to Medalist Industries, Inc. Multiple tier screen printer. 4,084,504, Cl. 101-115.000.
Fuhrhop, Ronald Elmer: *See*—
Engel, Stephen August; and Fuhrhop, Ronald Elmer, 4,084,988, Cl. 148-9.500.
Fuji Photo Film Co., Ltd.: *See*—
Ikechi, Masai, 4,085,415, Cl. 354-316.000.
Nakamura, Koichi; and Shimamura, Isao, 4,084,969, Cl. 96-60.00R.
Fuji Photo Optical Co., Ltd.: *See*—
Yoshino, Takeshi, 4,085,412, Cl. 354-106.000.
Fuji Xerox Co., Ltd.: *See*—
Yoshino, Masaki, 4,084,894, Cl. 353-34.000.
Fujii, Yoshihiko: *See*—
Odaka, Fumio; Fujii, Yoshihiko; and Iseda, Yutaka, 4,085,165, Cl. 260-859.00R.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Harada, Hirokichi, 4,085,277, Cl. 544-27.000.
Fujita, Mituo, to Kabushiki Kaisha Shinsei Industries. Tape printer. 4,084,679, Cl. 197-6.700.
Fujiura, Takashi; Tsutsui, Kunio; and Nishida, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Fuel tank breathing means for small size boats. 4,084,531, Cl. 114-211.000.
Fukuura, Yukio: *See*—
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.
Fukuwatari, Tadashi; Mishima, Kiyotaka; Ichimura, Hiroshi; and Kurihara, Hideaki, to Asahi Glass Company, Ltd. Fiber reinforced cementitious substrate. 4,085,001, Cl. 162-145.000.
Fulk, James B., to Fulk, James B. Method and apparatus for producing web units. 4,084,804, Cl. 270-52.500.
Fullerton, Donald Griswold; Kyrias, Gilbert Mowder; and Weber, Richard Baxter, to FMC Corporation. Biological oxidation and flotation apparatus and method. 4,085,041, Cl. 210-7.000.
G.B.C., Inc.: *See*—
Ehernberger, John E.; and Mazza, Bud, 4,084,496, Cl. 100-35.000.
Gaiser, Robert F., to Bendix Corporation, The. Brake system failure condition indicator. 4,084,377, Cl. 60-535.000.
Gales, Peter W., to Jos. Schlitz Brewing Company. Foam monitor and method. 4,084,426, Cl. 73-60.100.
Galis, Alex J., to North American Galis Company. Self-propelled material storage and feeding vehicle. 4,084,751, Cl. 241-25.000.
Gallagher, James P.; and Mooi, John, to Atlantic Richfield Company. Hydrodenitrogenation and hydrocracking catalyst. 4,085,068, Cl. 252-455.00R.
Gallant, Janice Anne, to Bendix Corporation, The. Phasing optimization at the feed probes of a parallel plate lens antenna. 4,085,404, Cl. 343-754.000.
Galley, Geoffrey Harrison, to Global Vision (U.K.) Limited. Manufacture of contact lenses. 4,084,458, Cl. 82-1.00C.
Galuschak, George; and Malkiel, Saul Leon, to Singer Company, The. Combined angular displacement measuring system and multiplier. 4,085,375, Cl. 328-160.000.
Galvagni, John L., to AVX Corporation. Tantalum chip capacitor. 4,085,435, Cl. 361-433.000.
Gambell, James W.; and Tinker, H. Burnham, to Monsanto Company. Production of di-unsaturated carboxylic acids. 4,085,275, Cl. 560-130.000.
Game Time, Inc.: *See*—
Melrose, Kendrick B.; Kimmel, Gerald E.; and McCombs, William F., 4,084,812, Cl. 272-85.000.
Garching Instrumente-Gesellschaft zur industriellen Nutzung von Forschungsergebnissen mbH: *See*—
Guilino, Ernst, 4,085,335, Cl. 307-88.300.
Gardiner, William P., to Byrd Industries, Inc. Winch with automatic clutch assembly. 4,084,793, Cl. 254-187.800.

Garofalo, Nicholas J. Hand held nut running and crimping power tool. 4,084,460, Cl. 81-10.000.

Gaspar, Peter. Rotary engines. 4,084,550, Cl. 123-245.000.

Gassert, Willy. Quick-acting hose or pipe coupling. 4,084,843, Cl. 285-105.000.

Gateau, Patrick: *See*—
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,085,055, Cl. 252-50.000.

Gausepohl, Hermann: *See*—
Seib, Karl; Schwarz, Wolfgang; and Gausepohl, Hermann, 4,085,264, Cl. 526-47.000.

Gauthier, John A.: *See*—
Thomas, Robert M.; and Gauthier, John A., 4,085,294, Cl. 179-16.0AA.

Gautschi, Fritz: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,085,109, Cl. 260-294.80E.

General Cable Corporation: *See*—
Olszewski, Jerzy A.; and Jachimowicz, Ludwig, 4,085,284, Cl. 174-36.000.

General Electric Company: *See*—
Crowe, William P., 4,084,291, Cl. 16-170.000.
Hamill, James S., 4,085,425, Cl. 358-237.000.
MacKenzie, Burton Thornley, Jr.; and Wilkus, Edward Vincent, 4,085,162, Cl. 260-848.000.
Merrill, Duane F., 4,085,084, Cl. 260-33.6SB.
Smith, William Edward, 4,085,150, Cl. 260-621.00R.
Swank, Robert K.; and Yang, Kei-Hsiung, 4,085,327, Cl. 250-370.000.

General Signal Corporation: *See*—
Engle, Thomas H., 4,084,858, Cl. 303-18.000.
Wilson, Charles A., 4,085,463, Cl. 366-176.000.

Genesco, Inc.: *See*—
Turner, Newton C., Jr., 4,084,279, Cl. 12-142.00R.

Genesi, Robert Charles, to Sprague Electric Company. Light detector system with photo diode and current-mirror amplifier. 4,085,411, Cl. 354-51.000.

Genovese, Nunzio N. Adjustable eyeless fishing rod. 4,084,343, Cl. 43-22.000.

Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; and Genrikh, Natalia Georgievna. High-voltage network for areas with high rate of icing. 4,085,338, Cl. 307-147.000.

Genrikh, Natalia Georgievna: *See*—
Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; and Genrikh, Natalia Georgievna, 4,085,338, Cl. 307-147.000.

Georg Menshen & Co. KG.: *See*—
Stahl, Otto; and Hins, Johannes, 4,084,728, Cl. 222-153.000.

Georgetown Steel Corporation: *See*—
Coward, Michael D.; Dobinski, William J.; and Hinson, Rocose M., Jr., 4,084,799, Cl. 266-207.000.

Georgopulos, Thomas, to GTE Automatic Electric Laboratories Incorporated. Low insertion force connector. 4,084,874, Cl. 339-75.0MP.

Gergen, William P.; and Davison, Sol, to Shell Oil Company. Multicomponent polyamide-block copolymer-polymer blends. 4,085,163, Cl. 260-857.00D.

Gergis, Isoris S.: *See*—
Chen, Thomas T.; and Gergis, Isoris S., 4,085,451, Cl. 365-4.000.

Gerkema, Jan T.; and Gorter, Frederik Willem, to U.S. Philips Corporation. Thin film magnetic head with a gap formed between a loop shaped core part and a bridging core part. 4,085,430, Cl. 360-119.000.

Gervasi, Enzo. Continuous filter with continuous cake removal. 4,085,050, Cl. 210-332.000.

Gesellschaft fur Strahlen- und Umweltforschung mbH: *See*—
Stengel, Eberhard; and Soeder, Carl Johannes, 4,084,346, Cl. 47-1.400.

Gewerkschaft Eisenhutte Westfalia: *See*—
Hohn, Walter, 4,084,386, Cl. 61-85.000.

GF Business Equipment, Inc.: *See*—
Koepke, Earl H., 4,084,699, Cl. 211-11.000.

Gibbons, John P.; and Chiang, Mutong T., to CPC International Inc. Carbohydrate thermoset resins. 4,085,075, Cl. 260-17.200.

Gibbons, John P.; and Wondolowski, Lawrence, to CPC International Inc. Carbohydrate-based condensation resin. 4,085,076, Cl. 260-17.200.

Gibson, Laurence Ernest: *See*—
Bull, Jeffrey Lawrence; Murphy, Tanya Ellen; and Gibson, Laurence Ernest, 4,084,859, Cl. 303-106.000.

Gilden, Meyer; Reeder, Thomas M.; and DeMaria, Anthony J., to United Technologies Corporation. Mode-locked, surface acoustic wave oscillator. 4,085,388, Cl. 331-107.00A.

Gilinson, Philip J., Jr.: *See*—
Ahn, Byong-Ho; Gilinson, Philip J., Jr.; and Moscaritolo, Anthony Michael, 4,084,428, Cl. 73-117.300.

Gillette Company, The: *See*—
Francis, John Frederick, 4,084,316, Cl. 30-47.000.

Gilmour, George A., to Westinghouse Electric Corporation. Underwater viewing system. 4,085,421, Cl. 358-81.000.

Ginsberg, Irwin L. Steam bath device for shower. 4,084,271, Cl. 4-161.000.

Ginsberg, Thomas, to Union Carbide Corporation. Protective coatings for ferrous metals. 4,084,971, Cl. 106-1.170.

Giordano, Annie Sue; Burke, Richard Lerda; and Wixon, Harold Eugene, to Colgate-Palmolive Company. Method of treating a fabric prior to ironing with an anionic fabric conditioning composition. 4,085,243, Cl. 427-387.000.

Givaudan Corporation: *See*—
Virgilio, Joseph A.; and Manowitz, Milton, 4,085,062, Cl. 252-300.000.

Glaum, Gerald Vernon: *See*—
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, 4,085,188, Cl. 423-32.000.

Glenn, Robert G., to Electric Power Research Institute, Inc. Turbine rotor with pin mounted ceramic turbine blades. 4,084,922, Cl. 416-220.00R.

Global Vision (U.K.) Limited: *See*—
Galley, Geoffrey Harrison, 4,084,458, Cl. 82-1.00C.

Godber, Geoffrey Allan, to Plessey Handel und Investments A.G. Method for manufacturing electrical solid state devices utilizing shadow masking and ion-implantation. 4,084,987, Cl. 148-1.500.

Godel, Siegfried; Pudims, Albert Adam; and Wergzyn, Richard, to Sperry Rand Corporation. Control circuit arrangement for a portable electrically heated hair treatment appliance. 4,085,309, Cl. 219-364.000.

Godfried, Leo M., to Fokker-VFW B. V. Fire-protecting epoxy resin reinforced with glass fiber. 4,085,247, Cl. 428-290.000.

GOETZEWERKE Friedrich Goetze AG: *See*—
Vossieck, Paul; and Deuring, Hans, 4,084,826, Cl. 277-134.000.

Golay, Marcel J. E., to Marcel Golay. Heat insulator. 4,084,574, Cl. 126-270.000.

Goldberg, Gerald M.: *See*—
Smith, Oliver Dale; and Goldberg, Gerald M., 4,085,059, Cl. 252-118.000.

Gomes, Gilbert Stephen: *See*—
Otrhalek, Joseph V.; Gomes, Gilbert Stephen; and Elfers, Gunther Hans, 4,085,000, Cl. 162-16.000.

Goodrich, Lewis Charles; Holt, Theron Robert; Osborne, Joseph Cyril; Pusey, Donald Kirk; and Roxlo, James William, to Du Pont de Nemours, E. I., and Company. Apparatus for determining denier of yarn. 4,084,434, Cl. 73-160.000.

Goodvin, Harold R. Bale lifter and carrier attachment. 4,084,708, Cl. 214-1.0HA.

Goodwin, Thomas E., to Continental Oil Company. Preparation of alkyl substituted 1,3-dimethylbenzenes. 4,085,155, Cl. 260-668.00R.

Goodyear Tire & Rubber Company, The: *See*—
Hillhouse, Mial T.; and Ramsey, Richard L., 4,085,179, Cl. 264-122.000.
Hopper, Roger J., 4,085,093, Cl. 260-79.50P.
Lawrence, John P., 4,085,094, Cl. 260-79.50B.

Gordos Corporation: *See*—
Lacis, Laimons; and Horvath, Steven, 4,085,392, Cl. 335-58.000.

Gorman, Harold R.; Dahlberg, John R.; and Oravitz, James L., Jr., to PPG Industries, Inc. Oilless fluid for scoring glass. 4,084,737, Cl. 225-2.000.

Gorski, Charles R.: *See*—
Schettl, Alvin J.; and Gorski, Charles R., 4,084,572, Cl. 126-200.000.

Gorter, Frederik Willem: *See*—
Gerkema, Jan T.; and Gorter, Frederik Willem, 4,085,430, Cl. 360-119.000.

Goser, Karl; and Mueller, Ruediger, to Siemens Aktiengesellschaft. Circuit arrangement in a complementary CHL technique. 4,085,339, Cl. 307-213.000.

Goshima, Takeshi: *See*—
Hirabayashi, Yoichi; Minami, Setsuo; and Goshima, Takeshi, 4,084,881, Cl. 350-6.800.

Goto, Kiyoshi: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Iida, Kazuyoshi; and Goto, Kiyoshi, 4,085,085, Cl. 260-38.000.

Goto, Tadahiro; and Soma, Munemasa, to Iwatsu Electric Co., Ltd. Multi-frequency signal receivers. 4,085,295, Cl. 179-84.0VF.

Gough & Company (Hanley) Limited: *See*—
Gough, George Terah, 4,084,446, Cl. 74-61.000.

Gough, George Terah, to Gough & Company (Hanley) Limited. Vibratory machine. 4,084,446, Cl. 74-61.000.

Goupil, Marcel; and Ruel, Marc. Hockey stick with reinforcement filament winding. 4,084,818, Cl. 273-67.00A.

Gram, Hans, to Brodrene Gram A/S. Rotary gear pump. 4,084,926, Cl. 418-19.000.

Grandia, Johannes; and Hill, John Charles, to International Business Machines Corporation. Process for slicing boules of single crystal material. 4,084,354, Cl. 51-283.00R.

Grant, Nicholas J.; and Robinson, Ramon K., to Massachusetts Institute of Technology. High Hf/C-containing alloys. 4,084,964, Cl. 75-171.000.

Grate, Anton J. Lamp and holder combination with adapter. 4,084,873, Cl. 339-52.00R.

Graul, William E.: *See*—
Schorsch, John B.; Graul, William E.; and Barash, David, 4,084,387, Cl. 62-63.000.

Grave, Burghard; Gutbier, Heinrich; and Deinzer, Michael, to Siemens Aktiengesellschaft. Water separation cell for removing the reaction water from the electrolyte of fuel cells and fuel cell batteries. 4,085,255, Cl. 429-26.000.

Gravina, Anthony N.; Lev, Kenneth D.; and Angst, Arthur H., to Grumman Aerospace Corporation. Rate measuring system. 4,085,363, Cl. 324-162.000.

Gray, Herbert Ray. Web cutting device. 4,084,469, Cl. 83-542.000.

Grec, John W.: *See*—
Kerwin, Daniel; Zoberis, Walter B.; Grec, John W.; and McDonald, James A., 4,084,501, Cl. 101-76.000.

Green, George Edward, to Ciba-Geigy Corporation. Actinically-induced polyermization. 4,085,019, Cl. 204-159.230.

Green, James Edmond. Method and apparatus for producing a suspension of biological cells on a substrate. 4,084,902, Cl. 356-38.000.

Green, Keith; and Lawson, Alastair, to Burroughs Corporation. Apparatus for recording and reproducing information with respect to a flexible recording medium. 4,085,428, Cl. 360-99.000.

Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; Knell, Everett W.; Mirza, Zia I.; and Winter, Bruce L., to Occidental Petroleum Corporation. Pyrolysis of carbonaceous materials with solvent quench recovery. 4,085,030, Cl. 208-8.000.

Green, William M. Process for producing a roasted peanut product. 4,085,230, Cl. 426-262.000.

Greenberg, Paul B.; and Patterson, Stephen D., to United Technologies Corporation. Thrust bearing damping means. 4,084,861, Cl. 308-26.000.

Gregory, Maurice James, to Ciba-Geigy AG. Silicon compounds containing nucleofugal phosphate group and method of regulating plant growth therewith. 4,084,951, Cl. 71-86.000.

Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. 4,085,393, Cl. 335-202.000.

Griffin, Charles: *See*—
Boone, Ralph D.; and Griffin, Charles, 4,084,610, Cl. 137-1.000.

Griffiths, Kenneth F. Process for manufacturing aluminum oxide. 4,085,201, Cl. 423-625.000.

Grigorian, Alfred Nikitovich: *See*—
Rakitin, Vladimir Jurievich; Fedorov, Igor Konstantinovich; Grigorian, Alfred Nikitovich; Lalov, Vitaly Viktorovich; and Prokofieva, Nina Vasilievna, 4,084,757, Cl. 241-301.000.

Grinage, Claude M., to Bullard Company, The. Clamping means for a tool block in a vertical boring machine or the like. 4,084,462, Cl. 82-36.00R.

Grise, Frederick G. J.; and Lovell, Walter. Conservation of electrical energy. 4,085,333, Cl. 290-2.000.

Grone, Siegfried: *See*—
Dittrich, Erich; and Grone, Siegfried, 4,084,419, Cl. 72-68.000.

Grosch, Steven Wayne; and Stack, Michael John. Day/night outside mirror for vehicles. 4,084,886, Cl. 350-281.000.

Grossman, Harold, to Montclair Research Corporation. Body of tobacco with a deposit of particles added thereto. 4,084,596, Cl. 131-17.00R.

Grot, Walther Gustav: *See*—
Resnick, Paul Raphael; and Grot, Walther Gustav, 4,085,071, Cl. 260-22.00R.

Gruffaz, Max; and Locatelli, Jean Louis, to Rhone-Poulenc Industries. Thermosetting compositions based on a bis-imide and a polyurethane. 4,085,164, Cl. 260-858.000.

Grumman Aerospace Corporation: *See*—
Gravina, Anthony N.; Lev, Kenneth D.; and Angst, Arthur H., 4,085,363, Cl. 324-162.000.
Hamel, Bernard B.; Muntz, Eric P.; and Scott, Paul B., 4,084,943, Cl. 55-17.000.

GTE Automatic Electric (Canada) Ltd.: *See*—
Thomas, Robert M.; and Gauthier, John A., 4,085,294, Cl. 179-16.0AA.

GTE Automatic Electric Laboratories Incorporated: *See*—
Georgopulos, Thomas, 4,084,874, Cl. 339-75.0MP.

Guess, Westphal Claude. Collapsable table. 4,084,517, Cl. 108-153.000.

Guilino, Ernst, to Garching Instrumente-Gesellschaft zur industriellen Nutzung von Forschungsergebnissen mbH. Optical parametric device. 4,085,335, Cl. 307-88.300.

Gulf Oil Corporation: *See*—
Doyle, William C., Jr.; and Botts, Marion F., 4,084,956, Cl. 71-111.000.

Gulf Research & Development Company: *See*—
Murphy, Harry C., Jr.; and Stauffer, Harry C., 4,085,036, Cl. 208-212.000.

Gulla, Michael, to Shipley Company Inc. Catalyst composition and method of preparation. 4,085,066, Cl. 252-434.000.

Gullotti, Damian V.: *See*—
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,084,963, Cl. 75-138.000.

Gurries, Raymond A., to CMI Corporation. Spool valve. 4,084,618, Cl. 137-625.480.

Gutbier, Heinrich: *See*—
Grave, Burghard; Gutbier, Heinrich; and Deinzer, Michael, 4,085,255, Cl. 429-26.000.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Katernberg, Helmut, 4,084,529, Cl. 114-46.000.

Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, to Xerox Corporation. Imaging system using agglomerable migration marking material. 4,084,966, Cl. 96-1.0PS.

Habecker, Charles N.: *See*—
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Habecker, Charles N., 4,085,211, Cl. 424-250.000.

Hachiga, Takasi, to Nippondenso Co., Ltd. Contactless ignition system for internal combustion engine. 4,084,567, Cl. 123-148.00E.

Hadley, Chris L.: *See*—
Roch, Gerald V.; and Hadley, Chris L., 4,084,424, Cl. 72-389.000.

Haggedal, Lars Roger. Bingo game. 4,084,823, Cl. 273-269.000.

Hagiwara, Tatsuo; Nomiyama, Fumihiro; and Nagaoka, Shigenori, to Kawasaki Jukogyo Kabushiki Kaisha. Gap adjusting system for crusher and method. 4,084,752, Cl. 241-30.000.

Hagood, John S.: *See*—
Stratbucker, Robert A.; and Hagood, John S., 4,085,407, Cl. 346-33.0ME.

Hahn, Frank J.; and Santer, James O., to Monsanto Company. Method of coating with liquid aminoplast polyfunctional resin compositions. 4,085,242, Cl. 427-385.00R.

Hahner, Reinhard: *See*—
Falchle, Jorg; and Hahner, Reinhard, 4,084,829, Cl. 279-99.000.

Halbich, Frank. Plastic pillbox. 4,084,695, Cl. 206-532.000.

Haley, Frederick. Automatic brake for wheeled carriages. 4,084,663, Cl. 188-31.000.

Halford, Phillip Charles, to Imperial Metal Industries (Kynoch) Limited. Anode assembly for electrodeposition cell. 4,085,026, Cl. 204-242.000.

Hallhagen, Rudolf G., to AB Sjuntorp. Oil fence. 4,084,380, Cl. 61-1.00F.

Hallmark Cards, Incorporated: *See*—
Brown, William E.; Magee, Ramon J.; and McCoy, Dennis R., 4,084,500, Cl. 101-28.000.

Hamel, Bernard B.; Muntz, Eric P.; and Scott, Paul B., to Grumman Aerospace Corporation. Jet membrane gas separator and method. 4,084,943, Cl. 55-17.000.

Hamill, James S., to General Electric Company. Precise control of television picture size and position. 4,085,425, Cl. 358-237.000.

Hamill, Robert L.: *See*—
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,085,224, Cl. 424-283.000.

Hamlin, Ralston L.: *See*—
Emmerich, Kenneth C.; and Hamlin, Ralston L., 4,084,856, Cl. 299-86.000.

Hammann, Ingeborg: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,085,226, Cl. 424-322.000.

Hamner, James W.: *See*—
Hightower, James O.; Hamner, James W.; and Matthews, Richard L., 4,084,992, Cl. 149-17.000.

Hampel, Hans: *See*—
Henschler, Dietrich; Wagner, Josef; and Hampel, Hans, 4,085,270, Cl. 560-105.000.

Hancock, Richard John Taylor, to University of Edinburgh, The University Court of the. Control of sex ratio in mammalian offspring. 4,085,205, Cl. 424-105.000.

Handa, Noritoshi, to Nissan Motor Company, Limited. Seal assembly for rotary disc-type matrix of gas turbine engine. 4,084,634, Cl. 165-9.000.

Hann, P. Douglas: *See*—
Dixon, Rolland E.; and Hann, P. Douglas, 4,085,158, Cl. 260-680.00E.

Hannon, David Malcolm, to International Business Machines Corporation. Method and apparatus for the controlled generation of wall encoded magnetic bubble domains. 4,085,454, Cl. 365-30.000.

Happe, Peter, to Johann Baptist Rombach, Karlsruhe, GmbH & Co. KG. Pipeline cutoff device. 4,084,617, Cl. 137-625.280.

Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, to Teijin Limited. Aromatic polymers containing a nitrogen-containing ring group, and process for preparation thereof. 4,085,090, Cl. 260-49.000.

Harada, Hirokichi, to Fujisawa Pharmaceutical Co., Ltd. 7(2-Phenyl or thienyl-2-isonicotinoyloxyacetamido)-3-(1-methyl-1-H tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid. 4,085,277, Cl. 544-27.000.

Harada, Yutaka: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Haraikawa, Tetsuo, to Tokico Ltd. Disc brake. 4,084,664, Cl. 188-71.900.

Harlan, Martin L.; Krause, John A.; and Brooks, Ronald L., to Wolverine World Wide, Inc. Drum skinner. 4,084,292, Cl. 17-50.000.

Harris, Gordon Colin; Vere, Robert Paul; and Walker, Ronald, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittannic Majesty's Government of the. Baling of waterborne craft. 4,084,530, Cl. 114-183.00R.

Harris-Intertype Corporation: *See*—
Krygeris, Algirdas J.; and Manring, John M., 4,085,402, Cl. 340-163.000.

Harshberger, Robert P., Jr., to Ampex Corporation. Tape transport dynamic brake. 4,085,354, Cl. 318-87.000.

Hartless, Arlington L.: *See*—
Anderson, Thomas F.; and Hartless, Arlington L., 4,085,160, Cl. 260-837.00R.

Hartwick, Norman John Reid; and Lathe, Donald Charles Clayton. Skimming apparatus. 4,085,049, Cl. 210-242.00S.

Hase, Takashi: *See*—
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.

Hasegawa, Kunio; Nishimura, Hidetomo; and Yamaguchi, Kiyoshi, to Hitachi, Ltd. Rotor for a rotary electrical machine having a superconductive field winding. 4,085,343, Cl. 310-52.000.

Hasegawa, Syoogo, to White Sewing Machine Company. Two-step buttonhole mechanism for sewing machine. 4,084,524, Cl. 112-158.00B.

Hasegawa, Tachio, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head having optimum spacer thickness disposed between dummy and write-in core segments. 4,085,429, Cl. 360-119.000.

Hashimoto, Masanao; Saitou, Tadashi; Kobayashi, Tatsuo; and Suzuki, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Secondary air supply system for internal combustion engines. 4,084,373, Cl. 60-293.000.

Hasler, William Sandford, to Shorrock Developments Limited. Vibration switch having threaded terminals and plural roller contacts. 4,085,304, Cl. 200-61.45R.

Hast, Gunnar. Sealing strip. 4,084,348, Cl. 49-475.000.

Hastings, Paul F. Lawn and yard implement. 4,084,284, Cl. 15-79.00A.

Hatayama, Katsuo: *See*—
Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; Sawada, Jiro; and Tanaka, Ichiro, 4,085,135, Cl. 260-520.00C.

Hattori, Tadashi; and Nakase, Takamichi, to Nippon Soken, Inc. Air-to-fuel ratio controlling system for internal combustion engines. 4,084,558, Cl. 123-97.00B.

Hattori, Tadashi; Iwata, Toshiharu; and Nakase, Takamichi, to Nippon Soken, Inc. Engine air-to-fuel ratio control system. 4,084,560, Cl. 123-119.0EC.

Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, to Nippon Soken, Inc. Additional air control device for an internal combustion engine. 4,084,563, Cl. 123-119.0EC.

Hattori, Yoshiyuki: *See*—
Takagi, Shigeru; and Hattori, Yoshiyuki, 4,084,839, Cl. 280-736.000.

Hatwell, Henri: *See*—
Quets, Jean Marie; and Hatwell, Henri, 4,085,037, Cl. 209-1.000.

Haubner, Georg: *See*—
Meier, Werner; Hofer, Walter; Haubner, Georg; and Weckenmann, Albert, 4,085,403, Cl. 340-168.00R.

Hawkins, Harold M., deceased (by Hawkins, Marjorie Wood, executrix), to Phillips Petroleum Company. Method and apparatus for conducting fermentation. 4,085,007, Cl. 195-109.000.

Hawkins, Marjorie Wood, executrix: *See*—
Hawkins, Harold M., deceased, 4,085,007, Cl. 195-109.000.

Haworth Mfg., Inc.: *See*—
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,366, Cl. 52-615.000.
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,367, Cl. 52-615.000.

Haworth, Richard G.: *See*—
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,366, Cl. 52-615.000.
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,367, Cl. 52-615.000.

Hayashi, Hideo: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; Iida, Kazuyoshi; and Goto, Kiyoshi, 4,085,085, Cl. 260-38.000.

Hayashi, Hiroshi: *See*—
Sano, Shiro; Hayashi, Hiroshi; and Takagi, Hiroyoshi, 4,084,979, Cl. 106-58.000.

Hayashi, Hisao: *See*—
Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Hayashi, Hisao, 4,084,986, Cl. 148-1.500.

Hayashi, Kikuo. Door structure. 4,084,866, Cl. 312-138.00R.

Hayashi, Kiyoshi, to Shin-Shirasuna Electric Corporation. Tape tension imparting apparatus. 4,084,768, Cl. 242-186.000.

Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic seat belt applying device. 4,084,841, Cl. 280-745.000.

Hayashi, Yoshimasa: *See*—
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; Sugihara, Kunihiko; and Takagi, Yasuo, 4,084,372, Cl. 60-278.000.

Hayashi, Yuzo: *See*—
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.

Hayes, John C.: *See*—
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,085,154, Cl. 260-668.00D.
Pollitzer, Ernest L.; and Hayes, John C., 4,085,067, Cl. 252-442.000.

Hayes, Thomas Edward: *See*—
Matthews, Russell Byron; and Hayes, Thomas Edward, 4,084,743, Cl. 236-1.00G.

Haynes, Elwood W. Revolvable rockable playpen. 4,084,273, Cl. 5-105.000.

Health Technology Laboratories, Inc.: *See*—
Stratbucker, Robert A.; and Hagood, John S., 4,085,407, Cl. 346-33.0ME.

Heckles, John S.; and Miller, Norman L., to Armstrong Cork Company. "Smoke-suppressant polyhalocarbon polymer compositions containing as plasticizer an unsaturated derivative of an ester polyol". 4,085,081, Cl. 260-31.40R.

Heimann, Edward W., to Wallace Business Forms, Inc. Continuous form multiple ply envelope assembly. 4,084,741, Cl. 229-69.000.

Heinrich, Theodore M.: *See*—
MacKenzie, Raymond W.; Wood, Peter; Heinrich, Theodore M.; and Oates, Robert M., 4,085,300, Cl. 219-10.49R.

Heinzl, Joachim; and Rosenstock, Guenter, to Siemens Aktiengesellschaft. Drive system for writing carriages in printing systems. 4,084,681, Cl. 197-82.000.

Helipebs Limited: *See*—
Skinner, Kenneth Charles, 4,084,303, Cl. 29-148.40D.

Hellmich, Gerhard, to Deggendorfer Werft und Eisenbau G.m.b.H. Hopper barge bottom seal construction. 4,084,527, Cl. 114-36.000.

Hennings, Willi: *See*—
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, 4,084,984, Cl. 106-300.000.

Henrie, Thomas A.; Lindstrom, Roald E.; and Lei, Kenneth P. V., to United States of America, Interior. Recovery of copper and nickel from alloys. 4,085,017, Cl. 204-123.000.

Henschler, Dietrich; Wagner, Josef; and Hampel, Hans, to Chemisch-Pharmazeutische Fabrik Adolf Klinge & Co. Sympathicomimetic acyloxy-phenylethanolamine. 4,085,270, Cl. 560-105.000.

Henzi, Beat, to Sandoz Ltd. Azo dyes containing a heterocyclic ring having a quaternized nitrogen atom and at least one optionally substituted phenoxyalkyl or naphthyloxyalkyl substituent. 4,085,098, Cl. 260-157.000.

Herbert, John T.; Sullivan, Paul E.; and Vitt, Stanley P., Jr., to Murdock Machine & Engineering Company of Texas. Ball valve with linear elastomeric seal mounting. 4,084,785, Cl. 251-172.000.

Herbold, Oskar; and Dittloff, Dieter, to Lampl, Helma. Method and apparatus for the pyrolysis of waste products. 4,084,521, Cl. 110-242.000.

Hercules Incorporated: *See*—
Lomax, George F., Jr.; and Coleman, Arthur A., 4,085,173, Cl. 264-3.00R.

Hergeth KG Maschinenfabrik und Apparatebau: *See*—
Naarding, Willem J., 4,084,433, Cl. 73-159.000.

Herzog, Fritz W., to Central Engineering Co., Inc. Street sweeper with multi-position gutter brush. 4,084,285, Cl. 15-87.000.

Hesston Corporation: *See*—
Fritz, David P.; Weigand, Rex O.; and Fleming, Gary L., 4,084,396, Cl. 56-98.000.

Hettick, Lon R. Tubular support for enclosing a body member. 4,084,586, Cl. 128-157.000.

Hevezi, James M.: *See*—
Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,085,324, Cl. 250-320.000.

Hewlett-Packard Co.: *See*—
Salesky, Emery; and Luehman, Kent W., 4,085,340, Cl. 307-237.000.

Heyraud, Marc; and Martin, Andre, to Portescap. Electric acutating device. 4,084,502, Cl. 101-93.290.

Higaki, Taiji: *See*—
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, 4,085,236, Cl. 427-121.000.

Higgins, Andrew D.: *See*—
Dewsnap, Ronald F.; Higgins, Andrew D.; and Beard, David E., 4,084,798, Cl. 266-131.000.

Higgins, Mark Allan: *See*—
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, 4,085,045, Cl. 210-58.000.

Hightower, James O.; Hamner, James W.; and Matthews, Richard L., to Thiokol Corporation. Solid propellant with alumina burning rate catalyst. 4,084,992, Cl. 149-17.000.

Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, to INTERx Research Corporation. Stable pro-drug forms of theophylline. 4,085,214, Cl. 424-253.000.

Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, to Japanese National Railways; Denki Kagaku Kogyo Kabushiki Kaisha; and Toa Doro Kogyo Co., Ltd. Quick hardening cement-asphalt composition. 4,084,981, Cl. 106-96.000.

Hiki, Fumihiko: *See*—
Nakai, Setsuo; Kita, Shinichiro; Hiki, Fumihiko; and Shimizu, Masayuki, 4,085,266, Cl. 526-65.000.

Hill, David George: *See*—
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,110, Cl. 260-294.80B.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,215, Cl. 424-258.000.

Hill, John Charles: *See*—
Grandia, Johannes; and Hill, John Charles, 4,084,354, Cl. 51-283.00R.

Hill, Ulderic Sylvio. Anti-burglar window shielding system and latch mechanism therefor. 4,084,519, Cl. 109-42.000.

Hillhouse, Mial T.; and Ramsey, Richard L., to Goodyear Tire & Rubber Company, The. Process for preparing dry mix brake lining. 4,085,179, Cl. 264-122.000.

Hilton, Richard Dickson. Digital waveform analyzer. 4,085,352, Cl. 315-169.00R.

Hins, Johannes: *See*—
Stahl, Otto; and Hins, Johannes, 4,084,728, Cl. 222-153.000.

Hinson, Rocose M., Jr.: *See*—
Coward, Michael D.; Dobinski, William J.; and Hinson, Rocose M., Jr., 4,084,799, Cl. 266-207.000.

Hinton, Jonathan W., to Champion Spark Plug Company. Lead-free glaze for alumina bodies. 4,084,976, Cl. 106-48.000.

Hirabayashi, Kanji, to Tokyo Shibaura Electric Co., Ltd. Multivalued data memory system using a charge coupled element. 4,085,459, Cl. 365-222.000.

Hirabayashi, Yoichi; Minami, Setsuo; and Goshima, Takeshi, to Canon Kabushiki Kaisha. Light beam scanning device. 4,084,881, Cl. 350-6.800.

Hiraki, Minoru: *See*—
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.

Hiraoka, Isao: *See*—
Aoki, Mitsuo; Watanabe, Kazuhiko; Murase, Shunichi; and Hiraoka, Isao, 4,085,207, Cl. 424-180.000.
Hirayama, Hiroyuki: *See*—
Shimazaki, Kazumi; and Hirayama, Hiroyuki, 4,085,258, Cl. 429-125.000.
Hirose, Toru: *See*—
Miyata, Shigeo; Hirose, Toru; and Iizima, Noriko, 4,085,088, Cl. 260-45.70R.
Hirschauer, Benoit: *See*—
Karinthi, Pierre; Dauvergne, Michel; and Hirschauer, Benoit, 4,085,252, Cl. 428-576.000.
Hirschmann, Adolf: *See*—
Franke, Rainer-Burkhard; Hirschmann, Adolf; and Kaser, Klaus, 4,084,730, Cl. 222-309.000.
Hisatomi, Yukuo: *See*—
Kanemaru, Toyonusuke; Hisatomi, Yukuo; and Nishimoto, Takafumi, 4,084,399, Cl. 57-140.00C.
Hitachi, Ltd.: *See*—
Hasegawa, Kunio; Nishimura, Hidetomo; and Yamaguchi, Kiyoshi, 4,085,343, Cl. 310-52.000.
Ikuzaki, Kunihiko; Ito, Tsuneo; Ishihara, Masamichi; and Sato, Takashi, 4,085,458, Cl. 365-206.000.
Ishida, Isao; Sato, Hiroshi; and Kusumoto, Sho, 4,084,862, Cl. 308-139.000.
Itoh, Kiyoo, 4,085,457, Cl. 365-205.000.
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.
Nakatani, Mitsuo, 4,084,506, Cl. 101-127.000.
Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased, 4,085,194, Cl. 423-242.000.
Shinohara, Katsuhiko; Kuramochi, Yoshinori; Suehiro, Tetsuo; and Matsubara, Ichiro, 4,085,334, Cl. 307-11.000.
Suwa, Masateru; and Komuro, Katsuhiro, 4,084,669, Cl. 191-45.00R.
Tsunoda, Yoshito; Maeda, Takeshi; and Oshida, Yoshitada, 4,085,423, Cl. 358-128.000.
Hjort, Bo, to Siemens Aktiengesellschaft. Method and apparatus for measuring the bioelectrical activity under an electrode resting on a patient. 4,084,583, Cl. 128-2.06R.
Ho, Ernest C.: *See*—
Belardi, Richard J.; Moyer, Norman E.; and Ho, Ernest C., 4,084,401, Cl. 58-4.00A.
Hobrough, Gilbert L. Peak amplitude protection system for ribbon loudspeakers. 4,085,299, Cl. 179-184.000.
Hochlehnert, Franz: *See*—
Frohlich, Alfons; and Hochlehnert, Franz, 4,084,297, Cl. 24-205.13C.
Hoechst Aktiengesellschaft: *See*—
Semler, Gunther; and Schaeffer, Georg, 4,085,129, Cl. 260-463.000.
Hoeckelman, Ralph F., to United States Steel Corporation. Chromium plating process employing manganese dioxide coated anodes. 4,085,013, Cl. 204-51.000.
Hoehn, Marvin M.: *See*—
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,085,224, Cl. 424-283.000.
Hofer, Walter: *See*—
Meier, Werner; Hofer, Walter; Haubner, Georg; and Weckenmann, Albert, 4,085,403, Cl. 340-168.00R.
Hoffman, William F.: *See*—
Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Hoffman, William F., 4,085,117, Cl. 260-332.20A.
Hogan, Elmer R.; Hollis, Charles Edward; and Simpson, John I., to Smith-Berger Manufacturing Corporation. Fish-beheading machine and process. 4,084,293, Cl. 17-52.000.
Hogan, Vaughan Clarence; and Landgreen, Eleanor Anderson, to International Telephone and Telegraph Corporation. Connector member. 4,084,882, Cl. 350-96.200.
Hohn, Walter, to Gewerkschaft Eisenhutte Westfalia. Apparatus for and a method of tunnelling. 4,084,386, Cl. 61-85.000.
Hokuryo Denko Co., Ltd.: *See*—
Niwata, Tatuji; Okubo, Kazutomo; Nakanishi, Fumio; and Yamada, Masanori, 4,085,422, Cl. 358-118.000.
Holcomb, Stanley W., to Texas Instruments Incorporated. Regulated DC to DC power supply with automatic recharging capability. 4,085,358, Cl. 320-9.000.
Hollenton, Frank; and Ingalls, John L. Method and apparatus for manipulating rod-like articles. 4,084,685, Cl. 198-461.000.
Hollis, Charles Edward: *See*—
Hogan, Elmer R.; Hollis, Charles Edward; and Simpson, John I., 4,084,293, Cl. 17-52.000.
Holmes, Jerry D., to Eastman Kodak Company. Manufacture of alpha,-beta-unsaturated acids and anhydrides. 4,085,143, Cl. 260-515.00R.
Holmstrom, Tord: *See*—
Schibbye, Hjalmar; and Holmstrom, Tord, 4,084,405, Cl. 62-197.000.
Holt, Theron Robert: *See*—
Goodrich, Lewis Charles; Holt, Theron Robert; Osborne, Joseph Cyril; Pusey, Donald Kirk; and Roxlo, James William, 4,084,434, Cl. 73-160.000.
Holznagel, Wilhelm: *See*—
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, 4,084,984, Cl. 106-300.000.
Homberg, Otto A.: *See*—
Singleton, Alan H.; Homberg, Otto A.; and Sheldrake, Charles W., 4,085,199, Cl. 423-574.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Kazunobu; Suzuki, Takanori; Kobayashi, Tadataka; and Miyazawa, Takeshi, 4,084,568, Cl. 123-182.000.
Honda, Shinichi: *See*—
Ishimori, Shigeru; and Honda, Shinichi, 4,085,010, Cl. 204-16.000.
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shosoh; and Suzuki, Yoshikatsu, to Bridgestone Tire Company Limited. Process for producing a high polymeric substance having isocyanate group. 4,085,262, Cl. 526-46.000.
Honecker, Gerhard: *See*—
Ohlinger, Manfred; Wagner, Gerhard; Honecker, Gerhard; Stritzinger, Heinz; and Spaehn, Heinz, 4,084,936, Cl. 21-2.70R.
Honegger, Werner: *See*—
Reist, Walter; and Honegger, Werner, 4,084,808, Cl. 271-213.000.
Honeywell Farms, Inc.: *See*—
Von Hagel, Leo J., 4,084,392, Cl. 53-131.000.
Honeywell Inc.: *See*—
Bibbero, Robert J., 4,084,906, Cl. 356-96.000.
Deziel, Frederick T., 4,084,547, Cl. 122-504.000.
Koepke, Barry G., 4,085,172, Cl. 264-1.000.
Nelson, Lorne W., 4,084,388, Cl. 62-152.000.
Wilwerding, Dennis J., 4,085,320, Cl. 250-201.000.
Honeywell Information Systems Inc.: *See*—
Michaels, Mark Joseph, 4,084,315, Cl. 29-740.000.
Hopkinson, David George: *See*—
Telling, Ronald Charles; Passingham, Roy John; Kitchener, Brian Lewis; and Hopkinson, David George, 4,085,203, Cl. 424-89.000.
Hopper, Roger J., to Goodyear Tire & Rubber Company, The. Sulfilimines as premature vulcanization inhibitors. 4,085,093, Cl. 260-79.50P.
Horii, Hideo: *See*—
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,263, Cl. 526-47.000.
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,265, Cl. 526-49.000.
Horowitz, William M. Guitar construction. 4,084,475, Cl. 84-291.000.
Horsfall, Harry: *See*—
Ashfield, Herbert Edward; and Horsfall, Harry, 4,084,641, Cl. 172-9.000.
Horsma, David August; and Diaz, Stephen Hunter, to Raychem Corporation. Heat-recoverable sealing article with self-contained heating means and method of sealing a splice therewith. 4,085,286, Cl. 174-92.000.
Horvath, Janos. Method and apparatus for generating buoyancy power via electrolysis. 4,084,375, Cl. 60-496.000.
Horvath, Steven: *See*—
Lacis, Laimons; and Horvath, Steven, 4,085,392, Cl. 335-58.000.
Hose, Eddy, to United States of America, Army. Inertial navigation system. 4,085,440, Cl. 364-454.000.
Hossalla, George J.; and Stein, Norman R., to Stein Industries, Inc. Refrigeration shelf. 4,084,703, Cl. 211-153.000.
Hotta, Takayosi: *See*—
Narushima, Hiroshi; and Hotta, Takayosi, 4,084,300, Cl. 29-26.00A.
Houdaille Industries, Inc.: *See*—
Farrell, John H., 4,084,349, Cl. 51-5.00D.
Schulz, Reginald O.; and Rivett, Larry R., 4,084,353, Cl. 51-220.000.
Hounsell, John Owen: *See*—
Sharp-Dent, Charles Edward Arthur; and Hounsell, John Owen, 4,084,652, Cl. 177-207.000.
Howald, Werner E. Combustion apparatus including an air-fuel premixing chamber. 4,084,371, Cl. 60-39.360.
Howard, Charles W., to Early California Industries, Inc. Fluid-blending system. 4,084,603, Cl. 137-88.000.
Howell, Mark Ian. Method and apparatus for determining the presence of or absence of an underground body. 4,085,360, Cl. 324-3.000.
Howmedica, Inc.: *See*—
Caraway, William Russell; and Falkingham, Clarence Mark, 4,084,590, Cl. 128-283.000.
Hoya Corporation: *See*—
Sagara, Hiroji, 4,084,978, Cl. 106-54.000.
Hozuma, Hiroshi: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Hrdlicka, Theodore Frederick; and Stafford, Floyd. Lighted fishing pole. 4,085,437, Cl. 362-109.000.
Hubbard, John T., Jr.: *See*—
Daniel, James A., Jr.; and Hubbard, John T., Jr., 4,084,830, Cl. 280-6.100.
Hughes Aircraft Company: *See*—
Asawa, Charles K.; and Plant, Thomas K., 4,085,387, Cl. 331-94.50M.
Belardi, Richard J.; Moyer, Norman E.; and Ho, Ernest C., 4,084,401, Cl. 58-4.00A.
McCoy, John H.; and Sullivan, Paul A., 4,085,329, Cl. 250-492.00A.
Moyer, Norman E., 4,084,402, Cl. 58-23.00R.
Hughes, Glenn: *See*—
Anderson, Jack William; and Hughes, Glenn, 4,084,748, Cl. 239-74.000.
Hughes, Robert G., to Continental Can Company of Canada Ltd. Bottle carrier. 4,084,688, Cl. 206-188.000.

Hughet, Roger E.: *See—*
Putt, Bernard J.; and Hughet, Roger E., 4,084,867, Cl. 312-198.000.
Hummert, George T.: *See—*
Quan, Wing C.; Edison, David M.; Hummert, George T.; and Sackin, Milton, 4,084,661, Cl. 187-29.00R.
Humphrey, William D.; and Becker, Allen. Self-erecting highway guide post. 4,084,914, Cl. 404-10.000.
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, to Bayer Aktiengesellschaft. Temperature-stable inorganic yellow pigments. 4,084,984, Cl. 106-300.000.
Hundstad, Richard L.: *See—*
Farish, Owen; and Hundstad, Richard L., 4,085,386, Cl. 331-94.5PE.
Hung, Ling Kong: *See—*
Bloom, Allen; Ross, Daniel Louis; Bartolini, Robert Alfred; and Hung, Ling Kong, 4,084,970, Cl. 96-88.000.
Hunt-Grubbe, Robert H.: *See—*
Turcotte, Ronald E.; and Hunt-Grubbe, Robert H., 4,085,323, Cl. 250-252.000.
Hurco Manufacturing Company Inc.: *See—*
Roch, Gerald V.; and Hadley, Chris L., 4,084,424, Cl. 72-389.000.
Huston, Charles W. Mason's guide. 4,084,321, Cl. 33-86.000.
Hydroconic Limited: *See—*
Corlett, Ewan Christian Brew, 4,084,534, Cl. 114-125.000.
Ibbotson, Arthur, to Imperial Chemical Industries Limited. Carbodiimides. 4,085,140, Cl. 260-566.00R.
Ichimura, Hiroshi: *See—*
Fukuwatari, Tadashi; Mishima, Kiyotaka; Ichimura, Hiroshi; and Kurihara, Hideaki, 4,085,001, Cl. 162-145.000.
Ichinose, Shiro. Device for adjusting phase of flat screen. 4,084,505, Cl. 101-123.000.
ICI Americas Inc.: *See—*
Rutledge, Thomas F., 4,085,124, Cl. 260-396.00N.
Iida, Kazuyoshi: *See—*
Tsuchiya, Shozo; Hayashi, Hideo; Iida, Kazuyoshi; and Goto, Kiyoshi, 4,085,085, Cl. 260-38.000.
Iijima, Tokuji, deceased: *See—*
Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased, 4,085,194, Cl. 423-242.000.
Iijima, Yoshie, administratrix: *See—*
Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased, 4,085,194, Cl. 423-242.000.
Iizima, Noriko: *See—*
Miyata, Shigeo; Hirose, Toru; and Iizima, Noriko, 4,085,088, Cl. 260-45.70R.
Ikechi, Masai, to Fuji Photo Film Co., Ltd. Photographic processing apparatus. 4,085,415, Cl. 354-316.000.
Ikeda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Optical copying apparatus. 4,084,904, Cl. 355-66.000.
Ikuzaki, Kunihiko; Ito, Tsuneo; Ishihara, Masamichi; and Sato, Takashi, to Hitachi, Ltd. Random access memory. 4,085,458, Cl. 365-206.000.
Ilin, Vadim Sergeevich: *See—*
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.
Ilon, Bengt Erland. Cover for a lifting device and method of utilizing same. 4,084,275, Cl. 5-81.00R.
Imai, Hirosuke: *See—*
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,263, Cl. 526-47.000.
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,265, Cl. 526-49.000.
Imanari, Makoto: *See—*
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.
Iminex GmbH: *See—*
Fruh, Ernst Josef, 4,084,753, Cl. 241-34.000.
Imperial Chemical Industries Limited: *See—*
Beswick, Geoffrey Ernest, 4,085,146, Cl. 260-600.00R.
Burrell, Raymond Alexander; and Cos, John Michael, 4,085,212, Cl. 424-251.000.
Cleare, Peter John Vernon, 4,085,148, Cl. 260-601.00H.
Ibbotson, Arthur, 4,085,140, Cl. 260-566.00R.
Lewis, John Didwith, 4,085,381, Cl. 330-147.000.
Preston, John; and Reeve, Austin John, 4,085,103, Cl. 260-250.00C.
Smith, Leslie Harold, 4,085,221, Cl. 424-275.000.
Tucker, Howard, 4,085,136, Cl. 260-559.00D.
Imperial Metal Industries (Kynoch) Limited: *See—*
Halford, Phillip Charles, 4,085,026, Cl. 204-242.000.
Imperial Oil Limited: *See—*
Todd, John C., 4,084,637, Cl. 166-245.000.
Todd, John C., 4,084,639, Cl. 166-248.000.
Inbar, Dan: *See—*
Mindick, Leo R.; Bruck, Avraham; Inbar, Dan; and Koss, Leopold G., 4,085,006, Cl. 195-103.700.
Industrial Drives, Inc.: *See—*
Francis, Melvin A., 4,084,789, Cl. 254-86.00R.
Industrial Dynamics Company, Ltd.: *See—*
Calhoun, Fredrick L., 4,084,686, Cl. 198-468.000.
Industrial Nucleonics Corporation: *See—*
Williams, Paul, 4,085,326, Cl. 250-339.000.
Ingalls, John L.: *See—*
Hollenton, Frank; and Ingalls, John L., 4,084,685, Cl. 198-461.000.
Ingersoll-Rand Company: *See—*
Kurt, Ewald Heinz, 4,084,646, Cl. 173-17.000.
Luthi, Oscar, 4,085,003, Cl. 162-259.000.
Ingram, Arlen E.; and Ingram, Norman H. Scrubber for golf balls. 4,084,287, Cl. 15-210.00R.
Ingram, Norman H.: *See—*
Ingram, Arlen E.; and Ingram, Norman H., 4,084,287, Cl. 15-210.00R.
Inoue, Takasuke: *See—*
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Muruyama, Mikio, 4,084,528, Cl. 114-45.000.
Institut Francais du Petrole: *See—*
Durand, Jean-Pierre; Gateau, Patrick; Dawans, Francois; and Chauvel, Bernard, 4,085,055, Cl. 252-50.000.
Mimoun, Hubert; Thao, Do; and Seree de Rochi, Irenee, 4,085,145, Cl. 260-592.000.
Institut National de la Recherche Agronomique: *See—*
Staron, Thadee Joseph, 4,085,229, Cl. 426-46.000.
Institute for Industrial Research and Standards: *See—*
Rees, Robin Gore, 4,084,535, Cl. 114-222.000.
Integrated Development & Manufacturing Co.: *See—*
Rule, Adrian O.; and Bartley, William E., 4,084,570, Cl. 126-140.000.
Intel Corporation: *See—*
Yen, Yao T., 4,084,869, Cl. 339-17.0CF.
International Audio Visual, Inc.: *See—*
Keegan, Pat, 4,085,296, Cl. 179-100.30R.
International Business Machines Corporation: *See—*
Blevins, Margaret Mary; and Bluethman, Robert Glenn, 4,085,445, Cl. 364-900.000.
Grandia, Johannes; and Hill, John Charles, 4,084,354, Cl. 51-283.00R.
Hannon, David Malcolm, 4,085,454, Cl. 365-30.000.
Kogge, Peter Michael, 4,085,448, Cl. 364-900.000.
Mathisen, Einar Skau, 4,084,909, Cl. 356-188.000.
Queener, Carl Allan, 4,084,897, Cl. 355-8.000.
Schmidt, John Michael; and Snow, Wallace Leon, 4,085,406, Cl. 343-895.000.
International Harvester Company: *See—*
Prosek, John R.; and Tamburino, James C., 4,084,852, Cl. 298-22.00C.
International Nickel Company, Inc., The: *See—*
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, 4,085,188, Cl. 423-32.000.
International Paper Company: *See—*
LaRosa, John, 4,084,910, Cl. 401-133.000.
International Standard Electric Corporation: *See—*
Ansberg, Chris; and Maisel, Klaus, 4,085,357, Cl. 318-590.000.
International Telephone and Telegraph Corporation: *See—*
Bae, Hyung Du, 4,084,425, Cl. 73-32.00A.
Hogan, Vaughan Clarence; and Landgreen, Eleanor Anderson, 4,084,882, Cl. 350-96.200.
Yamamoto, Stephen K., 4,084,875, Cl. 339-94.00M.
INTERx Research Corporation: *See—*
Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, 4,085,214, Cl. 424-253.000.
Ionescu, Marian I.; and Fettel, Bruce E., to Shiley Laboratories, Incorporated. Prosthetic tissue heart valve. 4,084,268, Cl. 3-1.500.
IRD Mechanalysis, Inc.: *See—*
Farstad, Johan T., 4,085,349, Cl. 310-319.000.
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., to Eastman Kodak Company. Benzotriazole ultraviolet stabilizing compounds and their use in organic compositions. 4,085,089, Cl. 260-45.8NT.
Iseda, Yutaka: *See—*
Odaka, Fumio; Fujii, Yoshihiko; and Iseda, Yutaka, 4,085,165, Cl. 260-859.00R.
Ishibashi, Toshihiro, to Yazaki Sogyo Kabushiki Kaisha. Solar water heater of natural circulation type. 4,084,578, Cl. 126-271.000.
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, to Japan Synthetic Rubber Co., Ltd.; and Kanzaki Paper Manufacturing Co., Ltd. Process for producing electrostatic recording material. 4,085,236, Cl. 427-121.000.
Ishida, Hajime; and Tsumita, Mitsuyo, to Tomy Kogyo Co., Inc. Baby chair and bed. 4,084,849, Cl. 297-22.000.
Ishida, Isao; Sato, Hiroshi; and Kusumoto, Sho, to Hitachi, Ltd. Thrust support system for vertical shaft rotary machine. 4,084,862, Cl. 308-139.000.
Ishida, Tsutomu; Nomura, Masaaki; and Ohta, Wasaburo, to Ricoh Company, Ltd. Electrostatic copying machine. 4,084,899, Cl. 355-14.000.
Ishiguro, Toshihiro: *See—*
Nohara, Akira; Ishiguro, Toshihiro; and Sanno, Yasushi, 4,085,116, Cl. 260-308.00D.
Ishihara, Masamichi: *See—*
Ikuzaki, Kunihiko; Ito, Tsuneo; Ishihara, Masamichi; and Sato, Takashi, 4,085,458, Cl. 365-206.000.
Ishikawa, Ryoichi: *See—*
Mizuno, Shioji; Ishikawa, Ryoichi; and Miyazaki, Mitsumasa, 4,085,086, Cl. 260-40.0TN.
Ishikawa, Tatsuo; Yamashita, Keiji; Okubo, Norio; Sakashita, Masahira; Okamoto, Arimichi; and Kusunose, Tetsuhiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for spinning modified synthetic fibers. 4,085,174, Cl. 264-49.000.
Ishimori, Shigeru; and Honda, Shinichi, to Suzuki Motor Company

Limited. Process for powder-dispersed composite plating. 4,085,010, Cl. 204-16.000.

Ishioka, Kunio: *See*—
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.

Ishizaka, Sunao, to Nippon Kogaku K.K. Aperture interlocking device for a single lens reflex camera of the interchangeable viewfinder type. 4,085,416, Cl. 354-219.000.

Ishizaki, Hidenosuke. Button. 4,084,295, Cl. 24-95.000.

Isles, Robert: *See*—
Bertram, Robert W.; Norgate, Graham; and Isles, Robert, 4,085,398, Cl. 338-25.000.

Isomedics, Incorporated: *See*—
Mindick, Leo R.; Bruck, Avraham; Inbar, Dan; and Koss, Leopold G., 4,085,006, Cl. 195-103.700.

Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Muruyama, Mikio, to Mitsui Engineering & Shipbuilding Co., Ltd. Working method of breaking up ship. 4,084,528, Cl. 114-45.000.

Itek Corporation: *See*—
Minnick, William A., 4,085,439, Cl. 364-200.000.

Ito, Hiromi, to Olympus Optical Co., Ltd. Dyeing and decolorization apparatus for use in a blood serum analyzer of an electrophoretic type. 4,084,541, Cl. 118-421.000.

Ito, Tsuneo: *See*—
Ikuzaki, Kunihiko; Ito, Tsuneo; Ishihara, Masamichi; and Sato, Takashi, 4,085,458, Cl. 365-206.000.

Itoh, Kiyoo, to Hitachi, Ltd. Memory system with a sense circuit. 4,085,457, Cl. 365-205.000.

Itoh, Masaki; and Yamasaki, Yorio, to Kawasaki Jukogyo Kabushiki Kaisha. Motorcycle stand with safety switch. 4,084,656, Cl. 180-103.00R.

Itou, Hidehiko: *See*—
Nakamura, Masahiko; and Itou, Hidehiko, 4,084,317, Cl. 30-94.000.

ITT Industries, Incorporated: *See*—
Budecker, Ludwig; and Winter, Klaus, 4,084,604, Cl. 137-101.000.

ITW-ATECO G.m.b.H.: *See*—
Schenk, Bernd, 4,084,913, Cl. 403-141.000.

Ivanoff, Alexander; and Ivanoff, Victor. Pump-motor assemblage for circulating a coolant. 4,084,924, Cl. 417-424.000.

Ivanoff, Victor: *See*—
Ivanoff, Alexander; and Ivanoff, Victor, 4,084,924, Cl. 417-424.000.

Ivanov, Lev Nikolaevich: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.

Iwami, Koichi: *See*—
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.

Iwata, Toshiharu: *See*—
Hattori, Tadashi; Iwata, Toshiharu; and Nakase, Takamichi, 4,084,560, Cl. 123-119.0EC.

Iwata, Tsuyoshi: *See*—
Takamizawa, Akira; and Iwata, Tsuyoshi, 4,085,128, Cl. 260-456.00A.

Iwatsu Electric Co., Ltd.: *See*—
Adachi, Syozo; and Tamori, Masato, 4,085,058, Cl. 252-62.10L.
Goto, Tadahiro; and Soma, Munemasa, 4,085,295, Cl. 179-84.0VF.

Izaki, Hiroshi, to Kubota, Ltd. Applicator nozzle for use in centrifugal casting. 4,084,632, Cl. 164-72.000.

Jachimowicz, Ludwig: *See*—
Olszewski, Jerzy A.; and Jachimowicz, Ludwig, 4,085,284, Cl. 174-36.000.

Jacobs, Bernard W.: *See*—
Waloszyk, John S.; and Jacobs, Bernard W., 4,084,332, Cl. 35-9.00G.

Jacobs, Jacob M., Jr. Vehicle mounted motorcycle rack. 4,084,736, Cl. 224-42.03B.

Jacobus, Nelson Mortimer, Jr.: *See*—
Billerbeck, Wilfred Jerome; and Jacobus, Nelson Mortimer, Jr., 4,085,395, Cl. 336-61.000.

Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., to TRW Inc. Holographic recording instrument for structural integrity verification and other applications. 4,084,427, Cl. 73-88.00A.

Janecek, Jiri: *See*—
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.

Janjua, Mohammad Barakat Ilahi; Claessens, Pierre L.; and Loutfy, Raouf O., to Noranda Mines Limited. Method and apparatus for the oxidation of organic material present in concentrated sulfuric acid. 4,085,016, Cl. 204-104.000.

Janome Sewing Machine Co. Ltd.: *See*—
Kasuga, Norboru, 4,084,523, Cl. 112-158.00A.

Janssen, Casper Johannes Gerardus Ferdinand; Postma, Lambertus; and Lippits, Gerardus Johannes Meinardus, to U.S. Philips Corporation. Method of manufacturing electrically conductive metal layers on substrates. 4,084,968, Cl. 96-48.0PD.

Janssen, Petrus Johannes: *See*—
Lippits, Gerardus Johannes Meinardus; Janssen, Petrus Johannes; Debruijn, Henricus Antonius; and van Ruler, Johannes, 4,085,285, Cl. 174-68.500.

Japan Non-Slip Pavement Co., Inc.: *See*—
Nakayama, Fukuzo, 4,085,176, Cl. 264-82.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, 4,085,236, Cl. 427-121.000.

Japanese National Railways: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Jaquith Industries, Inc.: *See*—
Shai, Arthur S., 4,084,328, Cl. 33-368.000.

Jarund Develo AB: *See*—
Jarund, Harry Sigurd Valdemar, 4,084,593, Cl. 128-295.000.

Jarund, Harry Sigurd Valdemar, to Jarund Develo AB. Bladder training apparatus. 4,084,593, Cl. 128-295.000.

Jen, Dixson Teh-Chao: *See*—
Liaukus, Sigitas Julius; and Jen, Dixson Teh-Chao, 4,085,442, Cl. 364-900.000.

Jenkins, John C., to TRW Inc. Weldable insulation fastener and apparatus for welding. 4,085,307, Cl. 219-98.000.

Jenks, Richard H.; and Kipp, Egbert M., to Revere Copper and Brass, Inc. Process for compression rolling of polymeric films. 4,085,187, Cl. 264-280.000.

Jensen, Bernhard: *See*—
Bathiany, Robert H.; and Jensen, Bernhard, 4,085,361, Cl. 324-57.0SS.

Jensen, William L., Jr.: *See*—
Wiley, Nathaniel C., Jr.; and Jensen, William L., Jr., 4,084,846, Cl. 296-1.00S.

Johann Baptist Rombach, Karlsruhe, GmbH & Co. KG: *See*—
Happe, Peter, 4,084,617, Cl. 137-625.280.

John Wyeth & Brother Ltd.: *See*—
Curran, Adrian Charles Ward; and Shepherd, Robin Gerald, 4,085,108, Cl. 260-283.0SC.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,110, Cl. 260-294.80B.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,085,215, Cl. 424-258.000.

John Zink Company: *See*—
Reed, Robert D.; and Schwartz, Robert E., 4,084,935, Cl. 431-202.000.

Johns-Manville Corporation: *See*—
Odle, Herbert Arnold; Ruehl, Donald Edward; Shadwick, Jan; Sullivan, Daryl Dean; and Welty, Dale Eugene, 4,085,318, Cl. 362-217.000.

Johnson, Alexander James: *See*—
Boyle, Henry Bryant; and Johnson, Alexander James, 4,084,430, Cl. 73-141.00R.

Johnson, Bruce K., to Polaroid Corporation. Battery assembly. 4,085,253, Cl. 429-1.000.

Johnson Controls, Inc.: *See*—
Matthews, Russell Byron; and Hayes, Thomas Edward, 4,084,743, Cl. 236-1.00G.

Johnson, Howard L., to Caterpillar Tractor Co. Cartridge type check valve. 4,084,609, Cl. 137-327.000.

Johnson & Johnson: *See*—
Tritsch, Ludwig, 4,084,592, Cl. 128-287.000.

Johnson, Leonard L., to Teco, Inc. Actuator for hydraulic systems in transportable mobile platforms. 4,084,619, Cl. 137-636.200.

Johnson, Matthey & Co., Limited: *See*—
Walter, Derek Oscar, 4,084,443, Cl. 73-517.00R.

Johnson, Robert Joseph: *See*—
Zenk, George Edward; Johnson, Robert Joseph; and Miller, Charles Newell, 4,085,302, Cl. 200-5.00A.

Johnson, Roy R., to KMS Fusion, Inc. Repetitive output laser system and method using target reflectivity. 4,084,908, Cl. 350-151.000.

Jones, David P., to Construction Products Corporation. Bell-and-spigot concrete pipe joint with plastic liner ring. 4,084,828, Cl. 277-207.00A.

Jones, Donald P., to Roblin Industries, Inc. Compression strut for suspended ceiling. 4,084,364, Cl. 52-484.000.

Jones, Hiram, Jr. Center finder. 4,084,325, Cl. 33-191.000.

Jones, John Arthur, to Borg-Warner Corporation. Process for preparing substituted triazines. 4,085,282, Cl. 544-197.000.

Jones, Ralph Archibald; and Drew, Allan Mathieson, to Post Office. Telephone conference amplifier. 4,085,290, Cl. 179-1.0CN.

Jones, Robert J. Waste heat utilization system. 4,084,745, Cl. 237-8.00R.

Jos. Schlitz Brewing Company: *See*—
Gales, Peter W., 4,084,426, Cl. 73-60.100.

Joyce, James E. Utility container. 4,084,865, Cl. 312-111.000.

Juergens, Wilfried; Roschy, Manfred; and Schauer, Alois, to Siemens Aktiengesellschaft. Process for the production of a thin-film circuit. 4,085,011, Cl. 204-37.00R.

Juguin, Bernard; Cosyns, Jean; LePage, Jean-Francois; and Miquel, Jean, to Societe Francaise des Produits pour Catalyse. New catalysts for hydrocarbon conversion to aromatics. 4,085,157, Cl. 260-673.000.

Jules, Samuel Edward; and McGarry, John James, Sr. Method for producing packing rings for fluid systems and the like. 4,085,184, Cl. 264-219.000.

Jules, Samuel Edward: *See*—
McGarry, John James, Sr.; and Jules, Samuel Edward, 4,084,929, Cl. 425-169.000.

Juncar, Patrick Pierre Paul: *See*—
Pinard, Jacques Andre; and Juncar, Patrick Pierre Paul, 4,084,907, Cl. 356-106.00S.

Juvonen, Vaino Esko, to Linden-Alimak AB. Hydraulically driven striking device. 4,084,486, Cl. 91-276.000.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See*—
Moritz, Werner, 4,084,370, Cl. 59-78.100.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kitashima, Riichi; Matsumoto, Masakazu; and Tagaki, Shinji, 4,084,473, Cl. 84-1.140.

Kabushiki Kaisha Meidensha: *See*—
Tezuka, Minoru; and Kito, Yastami, 4,084,662, Cl. 187-29.00R.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,084,507, Cl. 101-110.000.

Kabushiki Kaisha Shinsei Industries: *See*—
Fujita, Mituo, 4,084,679, Cl. 197-6.700.

Kabushiki Kaisha Taiheiseisakusho: *See*—
Tsutsumino, Takeyoshi, 4,084,420, Cl. 72-138.000.

Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, to Nippon Hoso Kyokai. Gaseous discharge light emitting element. 4,085,350, Cl. 313-486.000.

Kagami, Akiyasu: *See*—
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.

Kaieda, Shozo: *See*—
Muto, Masayuki; Tashima, Norio; Kaieda, Shozo; and Kamimura, Kuniaki, 4,085,408, Cl. 346-75.000.

Kaiya, Atsushi: *See*—
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,263, Cl. 526-47.000.
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,265, Cl. 526-49.000.

Kajima Corporation: *See*—
Yahiro, Teruo; and Yoshida, Hiroshi, 4,084,648, Cl. 175-67.000.

Kakigi, Takao, to Cybernet Electronic Corporation. Circuit for setting transmission and reception frequencies. 4,085,364, Cl. 325-20.000.

Kalashnikov, Yaroslav Alexeevich: *See*—
Farafontov, Vladimir Ivanovich; Kalashnikov, Yaroslav Alexeevich; Novikov, Jury Nikolaevich; Volpin, Mark Efimovich; Vereschagin, Leonid Fedorovich; and Lysanov, Vladislav Sergeevich, 4,085,196, Cl. 423-446.000.

Kalir, Rami: *See*—
Patchornik, Avraham; Warshawsky, Abraham; Fridkin, Matityahu; and Kalir, Rami, 4,085,261, Cl. 526-19.000.

Kalivas, Christopher G. Device to assist in holding a playing record to clean the same and the method of using the same. 4,084,824, Cl. 274-1.00R.

Kalmuk, Hans-Peter: *See*—
Kratel, Gunter; Bauer, Johann; Pichler, Engelbert; and Kalmuk, Hans-Peter, 4,085,087, Cl. 260-42.490.

Kalopissis, Gregoire, to L'Oreal. Process and cosmetic compositions for the treatment of skin and scalp. 4,085,217, Cl. 424-266.000.

Kamada, Hidemoto; Miura, Chiaki; and Kano, Etsuo, to Calpis Shokuhin Kogyo Kabushiki Kaisha. Process for manufacturing fast cooking rice. 4,085,234, Cl. 426-618.000.

Kameno, Yoshito: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.

Kamimura, Kuniaki: *See*—
Muto, Masayuki; Tashima, Norio; Kaieda, Shozo; and Kamimura, Kuniaki, 4,085,408, Cl. 346-75.000.

Kaminsky, Igor Viktorovich; Shestakov, Vladimir Vladimirovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; Litvinenko, Alexandr Fedorovich; Melnikov, Viktor Vasilievich; Zats, Boris Semenovich; Miropolsky, Mark Usherovich; and Maizlik, David Lvovich. Self-cleaning filter for cleaning liquids from suspended matter. 4,085,051, Cl. 210-333.00R.

Kanbara, Takahiro; and Mituhara, Toshihiko, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Apparatus for cutting and chamfering irregular shaped pipes. 4,084,463, Cl. 82-53.100.

Kanebo Ltd.: *See*—
Masuda, Yougoro; and Kawase, Shigeru, 4,085,057, Cl. 252-62.10P.

Kaneko, Tamaki; and Okuzawa, Tugio, to Ricoh Company, Ltd. Offset printing machine comprising improved control mechanism. 4,084,508, Cl. 101-142.000.

Kanemaru, Toyonusuke; Hisatomi, Yukuo; and Nishimoto, Takafumi, to Nippon Carbon Kabushiki Kaisha. Gut for racket. 4,084,399, Cl. 57-140.00C.

Kanmura, Hitoshi: *See*—
Sasakura, Hachiro; and Kanmura, Hitoshi, 4,084,548, Cl. 123-205.000.

Kano, Etsuo: *See*—
Kamada, Hidemoto; Miura, Chiaki; and Kano, Etsuo, 4,085,234, Cl. 426-618.000.

Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, 4,085,236, Cl. 427-121.000.
Kawakami, Takajiro; Mizuno, Minesilo; Okushi, Akira; and Yasuda, Michio, 4,085,237, Cl. 427-150.000.

Kappas, Nick. Ski case and rack. 4,084,735, Cl. 224-42.10E.

Karasudani, Yasuo, to Tokico Ltd. Disc brake caliper mounting. 4,084,666, Cl. 188-73.300.

Karikawa, Tohru, to Asahi Kogaku Kogyo Kabushiki Kaisha. Apparatus for retarding camera shutter release. 4,085,413, Cl. 354-137.000.

Karinthi, Pierre; Dauvergne, Michel; and Hirschauer, Benoit, to L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude. Composite wire with a base of cerium and other rare earths. 4,085,252, Cl. 428-576.000.

Karlberger, Walter Johann, to Morgardshammar Aktiebolag. Apparatus for twisting and guiding stock into roll grooves. 4,084,421, Cl. 72-231.000.

Karlberger, Walter Johann, to Morgardshammar Aktiebolag. Device intended for controlled cooling or wire, especially steel wire. 4,084,797, Cl. 266-106.000.

Karras, Ernest C., to Tekno Industries, Inc. Traffic usage recorder. 4,085,293, Cl. 179-8.00A.

Kasahara, Yasushi: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Kasai, Masao: *See*—
Misumi, Teruyuki; Miyaji, Toshio; and Kasai, Masao, 4,085,042, Cl. 210-33.000.

Kaser, Klaus: *See*—
Franke, Rainer-Burkhard; Hirschmann, Adolf; and Kaser, Klaus, 4,084,730, Cl. 222-309.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Input data-collating device. 4,085,312, Cl. 235-306.000.

Kashiwa, Norio: *See*—
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, 4,085,276, Cl. 526-122.000.

Kasuga, Norboru, to Janome Sewing Machine Co. Ltd. Cam selecting device for a sewing machine. 4,084,523, Cl. 112-158.00A.

Katernberg, Helmut, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Floating dry dock with lifting pontoons. 4,084,529, Cl. 114-46.000.

Kathawala, Faizulla G., to Sandoz, Inc. α-Alkyl-p-phenoxy benzyl alcohols. 4,085,149, Cl. 260-613.00R.

Kato, Sumio, to Teijin Limited. Process for producing electrically conductive synthetic fibers. 4,085,182, Cl. 264-171.000.

Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Novel morpholine derivatives and the treatment of mental depression. 4,085,210, Cl. 424-248.400.

Katz, Robert E. Bind-in insert. 4,084,696, Cl. 206-629.000.

Kauffman, William J., to Armstrong Cork Company. Disubstituted s-triazines. 4,085,268, Cl. 544-221.000.

Kawaguchi, Iwazo: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Kawahara, Toru: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.

Kawakami, Takajiro; Mizuno, Minesilo; Okushi, Akira; and Yasuda, Michio, to Kanzaki Paper Manufacturing Co., Ltd. Method and apparatus for manufacturing pressure sensitive copying sheet. 4,085,237, Cl. 427-150.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujiura, Takashi; Tsutsui, Kunio; and Nishida, Hiroshi, 4,084,531, Cl. 114-211.000.
Hagiwara, Tatsuo; Nomiyama, Fumihiro; and Nagaoka, Shigenori, 4,084,752, Cl. 241-30.000.
Itoh, Masaki; and Yamasaki, Yorio, 4,084,656, Cl. 180-103.00R.

Kawasaki, Yoichi: *See*—
Taniguchi, Seiho; Kawasaki, Yoichi; and Sugawara, Shin' Ichi, 4,085,249, Cl. 428-383.000.

Kawase, Shigeru: *See*—
Masuda, Yougoro; and Kawase, Shigeru, 4,085,057, Cl. 252-62.10P.

Kawashima, Hiroyuki: *See*—
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Muruyama, Mikio, 4,084,528, Cl. 114-45.000.

Kay, D. Alan R.; and Wilson, William G., to Molycorp, Inc. Methods of desulphurizing iron and steel and gases, such as stack gases and the like. 4,084,960, Cl. 75-58.000.

Kay, David, to Boots Company Limited, The. Control of processes. 4,084,442, Cl. 73-432.0PS.

KB-Denver, Inc.: *See*—
Dunlap, Bill D., 4,085,306, Cl. 200-275.000.

Keegan, Pat, to International Audio Visual, Inc. Modulated sound reading system. 4,085,296, Cl. 179-100.30R.

Keenan, John: *See*—
Keenan, Richard, 4,084,853, Cl. 298-24.000.

Keenan, Patrick: *See*—
Keenan, Richard, 4,084,853, Cl. 298-24.000.

Keenan, Richard, to Keenan, Richard; Keenan, Patrick; and Keenan, John, part interest to each. Hopper device for tractor vehicles. 4,084,853, Cl. 298-24.000.

Keeton, John H. Golf practice device. 4,084,822, Cl. 273-185.00D.

Keiser, John T.: *See*—
Poirier, Victor L.; and Keiser, John T., 4,084,266, Cl. 3-1.000.

Kelly, Charles A.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,085,089, Cl. 260-45.8NT.

Kelvinator, Inc.: *See*—
Schettl, Alvin J.; and Gorski, Charles R., 4,084,572, Cl. 126-200.000.

Kensetsu Kikai Chosa Kabushiki Kaisha: *See*—
Mizutani, Yutaka; and Aoki, Takashi, 4,084,336, Cl. 37-184.000.

Kerner, Karl: *See*—
Zehender, Ernst; Blaich, Bernhard; Stein, Helmut; and Kerner, Karl, 4,085,248, Cl. 428-336.000.

Kerr-McGee Chemical Corporation: *See*—
Poush, Kenneth A.; and Reynolds, James E., 4,085,027, Cl. 204-268.000.

Kersten, Samuel D., Jr., to Water Saver Faucet Co., Inc. Freeze proof emergency shower unit. 4,084,270, Cl. 4-145.000.

Kerwin, Daniel; Zoberis, Walter B.; Grec, John W.; and McDonald, James A., to Meyercord Co., The. Printing machine for printing groups of symbols. 4,084,501, Cl. 101-76.000.

Keuchel, Herbert W., to PNC Corporation. Process for producing a balanced nonwoven fibrous network by radial extrusion and fibrillation. 4,085,175, Cl. 264-51.000.

Keuer, Douglas W.: *See*—
McConnell, Robert B.; and Keuer, Douglas W., 4,085,126, Cl. 260-404.000.

Keuffel & Esser Company: *See*—
Kooi, J. Peter E., 4,084,327, Cl. 33-299.000.

KFC Corporation: *See*—
Sullivan, Neal, 4,084,492, Cl. 99-330.000.

Khan, Aman Ullah, to Whirlpool Corporation. Refuse compactor. 4,084,497, Cl. 100-53.000.

Khavkin, Viktor Pavlovich: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Taygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.

Kibler, Nelson S. Scissor style paper clip and automatic dispenser for same. 4,084,864, Cl. 312-42.000.

Kiefer, Hans-Friedrich, to Robert Bosch GmbH. Sound motion-picture camera. 4,084,891, Cl. 352-22.000.

Kiel, Wolfgang: *See*—
Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, 4,085,141, Cl. 260-570.00R.

Kikuchi, Hideo: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.

Killingbeck, Graydon Wayne: *See*—
Suh, Kyung W.; and Killingbeck, Graydon Wayne, 4,085,073, Cl. 260-2.50E.

Killinger, John J.: *See*—
Kornis, Gabriel; Nidy, Eldon G.; Vostral, Henry J.; and Steinhards, Arnolds, deceased, 4,084,955, Cl. 71-92.000.

Killion, Marvin L. Turf perforating machine. 4,084,642, Cl. 172-21.000.

Kim, Raymond W. H.: *See*—
Bagby, John P.; Figge, Erwin E.; and Kim, Raymond W. H., 4,084,892, Cl. 352-29.000.

Kimberley, David, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Redundant off-axis sensor assemblies. 4,084,774, Cl. 244-194.000.

Kimmel, Gerald E.: *See*—
Melrose, Kendrick B.; Kimmel, Gerald E.; and McCombs, William F., 4,084,812, Cl. 272-85.000.

Kimoto, Sadatoshi: *See*—
Adachi, Ikuo; Ueda, Motohiko; and Kimoto, Sadatoshi, 4,085,114, Cl. 260-307.0DA.

Kindervater, Friedrich: *See*—
Hund, Franz; Holznagel, Wilhelm; Erfurth, Henning; Kindervater, Friedrich; and Hennings, Willi, 4,084,984, Cl. 106-300.000.

Kine, Masayoshi, to Shimano Industrial Company Limited. Brake lever for a bicycle. 4,084,449, Cl. 74-480.00R.

King, Alfred T. Automatically operational net weight filling machine. 4,084,626, Cl. 141-7.000.

King Radio Corporation: *See*—
Teter, Robert D.; Maddock, James W.; and Rothers, Paul L., 4,084,439, Cl. 73-718.000.

King, Roderick V., to VCA Corporation. Container and closure. 4,084,717, Cl. 215-217.000.

Kingsbury, William D., to SmithKline Corporation. Intermediate for dephthaloylation of azetidinone compounds. 4,085,100, Cl. 260-239.00A.

Kinney, Alfred W., to Phillips Petroleum Company. Method and apparatus for forming pleated closure construction. 4,084,488, Cl. 93-36.00B.

Kinzler, Raymond Carl, to Koppers Company, Inc. Reversing method and apparatus for the automatic heating change-over of a coke oven battery. 4,085,008, Cl. 202-151.000.

Kipp, Egbert M.: *See*—
Jenks, Richard H.; and Kipp, Egbert M., 4,085,187, Cl. 264-280.000.

Kirby, Raymond L.: *See*—
Kullmann, Donald J.; Seltzer, Daniel A.; and Kirby, Raymond L., 4,085,287, Cl. 178-66.00R.

Kirk, Glenn E.; and Medesha, Alfred L., to Motorola, Inc. Electrically isolated heat sink lead frame for plastic encapsulated semiconductor assemblies. 4,084,312, Cl. 29-588.000.

Kirk, John Cyril: *See*—
Leslar, David Louis; and Kirk, John Cyril, 4,085,292, Cl. 179-2.00A.

Kirschner, Jurgen: *See*—
Wechsung, Reiner; and Kirschner, Jurgen, 4,085,022, Cl. 204-192.00E.

Kita, Shinichiro: *See*—
Nakai, Setsuo; Kita, Shinichiro; Hiki, Fumihiko; and Shimizu, Masayuki, 4,085,266, Cl. 526-65.000.

Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Driving mechanism for a timepiece. 4,084,403, Cl. 58-23.00D.

Kitashima, Riichi; Matsumoto, Masakazu; and Tagaki, Shinji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electric piano. 4,084,473, Cl. 84-1.140.

Kitchener, Brian Lewis: *See*—
Telling, Ronald Charles; Passingham, Roy John; Kitchener, Brian Lewis; and Hopkinson, David George, 4,085,203, Cl. 424-89.000.

Kito, Yastami: *See*—
Tezuka, Minoru; and Kito, Yastami, 4,084,662, Cl. 187-29.00R.

Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,085,226, Cl. 424-322.000.

Klein, Norman E.; and Stewart, William H., Jr., to Milliken Research Corporation. Dyeing and printing of materials. 4,084,615, Cl. 137-624.110.

Kmetz, Richard C.; and Miner, Leland P., to Monsanto Company. Formaldehyde solutions stabilized with interpolymers of vinyl acetate, vinyl acetal and vinyl alcohol. 4,085,079, Cl. 260-29.60B.

KMS Fusion, Inc.: *See*—
Johnson, Roy R., 4,084,908, Cl. 350-151.000.
Sigler, Robert D., 4,084,887, Cl. 350-294.000.

Knell, Everett W.: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; Knell, Everett W.; Mirza, Zia I.; and Winter, Bruce L., 4,085,030, Cl. 208-8.000.

Knickerbocker, Robert H., to Siemon-Dynamic Mfg. Company, The. Electrical connectors and terminal connecting block. 4,084,877, Cl. 339-97.00P.

Kobayashi, Tadataka: *See*—
Sato, Kazunobu; Suzuki, Takanori; Kobayashi, Tadataka; and Miyazawa, Takeshi, 4,084,568, Cl. 123-182.000.

Kobayashi, Tatsuo: *See*—
Hashimoto, Masanao; Saitou, Tadashi; Kobayashi, Tatsuo; and Suzuki, Isamu, 4,084,373, Cl. 60-293.000.

Koenig, Elmer A., to Sherwood Medical Industries Inc. Parenteral drug storage device with closure piercing coupling member. 4,084,588, Cl. 128-218.00R.

Koepke, Barry G., to Honeywell Inc. High strength halides. 4,085,172, Cl. 264-1.000.

Koepke, Earl H., to GF Business Equipment, Inc. File unit. 4,084,699, Cl. 211-11.000.

Kogge, Peter Michael, to International Business Machines Corporation. Data communication bus structure. 4,085,448, Cl. 364-900.000.

Kohler, Gisbert; Munkel, Hanns-Wilfried; Pohl, Hubert; Sommer, Walter; and Wendel, Gunther, to SKF Kugellagerfabriken GmbH. Apparatus for mounting an open end spinning turbine. 4,084,860, Cl. 308-15.000.

Kohshoh Limited: *See*—
Noda, Taizo, 4,084,299, Cl. 24-250.000.

Koike, Junro: *See*—
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.

Kojima, Atsuyuki: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.

Kojima, Takehiro: *See*—
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.

Kolbe, Wolfgang: *See*—
Atallah, Khaled; Berthold, Fritz; Kolbe, Wolfgang; Rauschenbach, Peter; and Simon, Helmut, 4,085,325, Cl. 250-328.000.

Kolesnichenko, Anatoly Alexeevich: *See*—
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.

Kolosov, Leonid Pavlovich: *See*—
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivano-

vich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.

Koltyrev, Dmitry Nikiforovich: *See—*
Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Koltyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna, 4,084,484, Cl. 90-24.00C.

Koltz, Lawrence D.; and Pritzlaff, Herbert E., to Wisconsin Centrifugal, Inc. Apparatus and method for aligning and welding tubular metal components together. 4,084,739, Cl. 228-168.000.

Komanowsky, Michael; and Sinnamon, Howard I., to United States of America, Agriculture. Treatment of lime-sulfide tannery unhairing waste. 4,085,044, Cl. 210-45.000.

Komuro, Katsuhiro: *See—*
Suwa, Masateru; and Komuro, Katsuhiro, 4,084,669, Cl. 191-45.00R.

Kondo, Masatsune; Sawami, Yoshiaki; and Tamura, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seam in a body outer panel of a vehicle. 4,084,847, Cl. 296-28.00R.

Konosu, Akira: *See—*
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.

Kooi, J. Peter E., to Keuffel & Esser Company. Theodolite adjusting means. 4,084,327, Cl. 33-299.000.

Koppers Company, Inc.: *See—*
Kinzler, Raymond Carl, 4,085,008, Cl. 202-151.000.

Kornis, Gabriel; Nidy, Eldon G.; Vostral, Henry J.; and Steinhards, Arnolds, deceased (by Killinger, John J.), to Upjohn Company, The. Organic compounds and process. 4,084,955, Cl. 71-92.000.

Koss, Leopold G.: *See—*
Mindick, Leo R.; Bruck, Avraham; Inbar, Dan; and Koss, Leopold G., 4,085,006, Cl. 195-103.700.

Kowalczyk, Adam V. Carpet installation tool. 4,084,787, Cl. 254-57.000.

Krapcho, John; and Turk, Chester Frank, to E. R. Squibb & Sons, Inc. 2-Amino-8-arylideno-3,4,5,6,7,8-hexahydro-4-arlypyrido[4,3-d]pyrimidines. 4,085,102, Cl. 542-450.000.

Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. 7-Aminoalkyl-3,7-diaryl-3,3A,4,5,6,7-hexahydro-2H-indazoles. 4,085,280, Cl. 544-140.000.

Krapcho, John: *See—*
Turk, Chester F.; and Krapcho, John, 4,085,142, Cl. 260-570.5CA.

Kratel, Gunter; Bauer, Johann; Pichler, Engelbert; and Kalmuk, Hans-Peter, to Wacker Chemie GmbH. Method of reducing static electricity in plastic compositions and antistatic compositions. 4,085,087, Cl. 260-42.490.

Krause, John A.: *See—*
Harlan, Martin L.; Krause, John A.; and Brooks, Ronald L., 4,084,292, Cl. 17-50.000.

Krebs, Gerd: *See—*
Eichholz, Werner; and Krebs, Gerd, 4,084,998, Cl. 156-403.000.

Kregness, Glen Roy: *See—*
Pertl, Jerry Hudson; and Kregness, Glen Roy, 4,085,447, Cl. 364-900.000.

Krehbiel, Vivian D., to Kreonite Inc. Liquid mixing device. 4,084,796, Cl. 366-137.000.

Kreonite Inc.: *See—*
Krehbiel, Vivian D., 4,084,796, Cl. 366-137.000.

Kreusler, George E. Router clamp. 4,084,629, Cl. 144-134.00D.

Krygeris, Algirdas J.; and Manring, John M., to Harris-Intertype Corporation. Multiplexing of actuator control signals. 4,085,402, Cl. 340-163.000.

KTA Corporation: *See—*
Tragert, William, 4,084,616, Cl. 137-625.400.

Kubach, Hans; and Zieher, Peter, to Robert Bosch GmbH. Amplifier for floating voltage source. 4,085,379, Cl. 330-69.000.

Kubat, Zdenek: *See—*
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.

Kubota, Ltd.: *See—*
Izaki, Hiroshi, 4,084,632, Cl. 164-72.000.

Kuckhermann, Gustav. Roll support assembly. 4,084,761, Cl. 242-58.600.

Kuelzer, Peter: *See—*
Reier, Richard; and Kuelzer, Peter, 4,084,678, Cl. 197-1.00R.

Kuhn, Franz Josef: *See—*
Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, 4,085,216, Cl. 424-263.000.

Kukino, Yoshinori; Miura, Mitsuo; and Aoyagi, Hayao, to Takenaka Komuten Co., Ltd. Apparatus and method for multiple spindle kneading for improving ground. 4,084,383, Cl. 61-36.00R.

Kulikov, Vasily Ivanovich: *See—*
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.

Kullmann, Donald J.; Seltzer, Daniel A.; and Kirby, Raymond L., to Neptune Water Meter Company. Data transmitting apparatus. 4,085,287, Cl. 178-66.00R.

Kulvi, Ruth L. Urine collection apparatus. 4,084,589, Cl. 128-278.000.

Kumazawa, Toshiharu, to Mitsubishi Precision Co., Ltd. Combustion apparatus. 4,084,934, Cl. 431-189.000.

Kunz, Andrew M.; Yates, Donald B.; and Tuck, Richard L., to Pullman Incorporated. Locking mechanism for hopper door actuator assembly. 4,084,515, Cl. 105-240.000.

Kunzmann, Konrad, to Alfelder Machinen-und Modellfabrik Kunkel, Wagner & Co. KG. Method and device for controlling a casting machine. 4,084,631, Cl. 164-4.000.

Kuo, Yu-Neng: *See—*
Higuchi, Takeru; Bodor, Nicolae S.; and Kuo, Yu-Neng, 4,085,214, Cl. 424-253.000.

Kuramochi, Yoshinori: *See—*
Shinohara, Katsuhiko; Kuramochi, Yoshinori; Suehiro, Tetsuo; and Matsubara, Ichiro, 4,085,334, Cl. 307-11.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.

Kurihara, Hideaki: *See—*
Fukuwatari, Tadashi; Mishima, Kiyotaka; Ichimura, Hiroshi; and Kurihara, Hideaki, 4,085,001, Cl. 162-145.000.

Kurita, Takaji, to Minolta Camera Kabushiki Kaisha. Photocopying apparatus mirror drive means. 4,084,898, Cl. 355-8.000.

Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; Sugihara, Kunihiko; and Takagi, Yasuo. Internal combustion engine. 4,084,372, Cl. 60-278.000.

Kuroda, Masahiro; and Yoshimura, Hiromitsu, to Anritsu Electric Company Limited. Amplitude modulation circuit. 4,085,389, Cl. 332-31.00T.

Kuroda, Osamu: *See—*
Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased, 4,085,194, Cl. 423-242.000.

Kurokawa, Teruo: *See—*
Matsudo, Kazuo; Shimomura, Takayoshi; and Kurokawa, Teruo, 4,084,991, Cl. 148-31.500.

Kurrat, Klaus, to Daimler-Benz Aktiengesellschaft. Vibration damper for vehicle spring systems. 4,084,667, Cl. 188-275.000.

Kurt, Ewald Heinz, to Ingersoll-Rand Company. Fluid actuated impact tool. 4,084,646, Cl. 173-17.000.

Kusakabe, Haruhiko: *See—*
Nakagawa, Kiyoshi; Otaki, Yukio; Mineo, Masatoshi; Aratani, Yoshio; Tatsuoka, Yoshio; and Kusakabe, Haruhiko, 4,084,622, Cl. 139-420.00R.

Kusumoto, Sho: *See—*
Ishida, Isao; Sato, Hiroshi; and Kusumoto, Sho, 4,084,862, Cl. 308-139.000.

Kusunose, Tetsuhiro: *See—*
Ishikawa, Tatsuo; Yamashita, Keiji; Okubo, Norio; Sakashita, Masahira; Okamoto, Arimichi; and Kusunose, Tetsuhiro, 4,085,174, Cl. 264-49.000.

Kwor, Y. C. Richard: *See—*
Akonteh, Ayola Ngwa; and Kwor, Y. C. Richard, 4,084,831, Cl. 280-11.200.

Kyo, Han Cha. Hitting device for martial arts. 4,084,811, Cl. 272-76.000.

Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; Sawada, Jiro; and Tanaka, Ichiro, to Taisho Pharmaceutical Co., Ltd. 2-(Carboxymethoxy)-chalcones. 4,085,135, Cl. 260-520.00C.

Kyowa Chemical Industry Co., Ltd.: *See—*
Miyata, Shigeo; Hirose, Toru; and Iizima, Noriko, 4,085,088, Cl. 260-45.70R.

Kyrias, Gilbert Mowder: *See—*
Fullerton, Donald Griswold; Kyrias, Gilbert Mowder; and Weber, Richard Baxter, 4,085,041, Cl. 210-7.000.

Labana, Santokh S.; and Chang, Yun Feng, to Ford Motor Company. Powder coating compositions with hydroxy containing acrylic copolymers-I and carboxylic acid or anhydride crosslinking agent. 4,085,260, Cl. 526-16.000.

Labelle, Camille A., to Armco Steel Corporation. Slide gate sealing closure. 4,084,784, Cl. 251-147.000.

Labora Mannheim GmbH fur Labortechnik: *See—*
Franke, Rainer-Burkhard; Hirschmann, Adolf; and Kaser, Klaus, 4,084,730, Cl. 222-309.000.

Lacis, Laimons; and Horvath, Steven, to Gordos Corporation. Reed switch construction. 4,085,392, Cl. 335-58.000.

Lagneau, Jean Henri. Liquid-actuated weighing apparatus. 4,084,651, Cl. 177-192.000.

Laignel, Raymond A.; and Mommeja, Patrick F., to Constructions Metalliques de Provence. Cocks having rotating valves and sliding seats. 4,084,608, Cl. 137-316.000.

Lainez, Lucien; Fichot, Bernard; and Bijon, Jean-Paul, to Thomson-Brandt. Container for video discs. 4,084,694, Cl. 206-444.000.

L'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Karinthi, Pierre; Dauvergne, Michel; and Hirschauer, Benoit, 4,085,252, Cl. 428-576.000.

Laitram Corporation, The: *See—*
Lapeyre, James M., 4,084,687, Cl. 198-844.000.

Lalov, Vitaly Viktorovich: *See—*
Rakitin, Vladimir Jurievich; Fedorov, Igor Konstantinovich; Grigorian, Alfred Nikitovich; Lalov, Vitaly Viktorovich; and Prokofieva, Nina Vasilievna, 4,084,757, Cl. 241-301.000.

Lam, David Nicholas; and Lam, Stephen Joseph. Vibration free diamond polishing workbench. 4,084,351, Cl. 51-109.00R.

Lam, Stephen Joseph: *See*—
Lam, David Nicholas; and Lam, Stephen Joseph, 4,084,351, Cl. 51-109.00R.

Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, to Ciba-Geigy AG. Polymers of vinyl acetate plasticized with low molecular weight polyesters. 4,085,082, Cl. 260-31.600.

Lamb, Frank; Combey, Malcolm; and Cooper, Hugh Melvin, to Ciba-Geigy AG. Plasticized polymers of vinyl acetate. 4,085,083, Cl. 260-31.600.

Lambert, Bernard Leon, to Societe Anonyme Potain Poclain Materiel (P.P.M.). Stabilizing apparatus incorporating telescopic structures. 4,084,777, Cl. 248-287.000.

Lampl, Helma: *See*—
Herbold, Oskar; and Dittloff, Dieter, 4,084,521, Cl. 110-242.000.

Landers, Don B.; and Brock, Robert K., to Oil States Rubber Company. Shock energy absorbing multi-segment load cell. 4,084,801, Cl. 267-140.000.

Landgreen, Eleanor Anderson: *See*—
Hogan, Vaughan Clarence; and Landgreen, Eleanor Anderson, 4,084,882, Cl. 350-96.200.

Landstingens Inkopscentral, Lic, Ekonomisk Forening: *See*—
Anfelt, Bertil, 4,084,265, Cl. 2-163.000.

Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, to Boehringer Ingelheim GmbH. 2-(4-Phenyl-4-cyano-n-butyl)-1,2,3,4-tetrahydro-5(H)-pyrido-[4,3-b]-indoles and salts thereof. 4,085,216, Cl. 424-263.000.

Lapeyre, James M., to Laitram Corporation, The. Conveyor having resilient conveying surface. 4,084,687, Cl. 198-844.000.

LaRosa, John, to International Paper Company. Disposable self-contained liquid applicator. 4,084,910, Cl. 401-133.000.

Laserson, Gregory L.; and Madarasz, Miklos, to Sealectro Corporation. Miniature matrix programming board. 4,084,870, Cl. 339-18.00P.

Lathe, Donald Charles Clayton: *See*—
Hartwick, Norman John Reid; and Lathe, Donald Charles Clayton, 4,085,049, Cl. 210-242.00S.

Lauck, Helmut, to Varta Batterie Aktiengesellschaft. Light metal galvanic element. 4,085,259, Cl. 429-194.000.

Laurel Bank Machine Co., Ltd.: *See*—
Ohsako, Kyoichi; and Yamashita, Katusuke, 4,085,311, Cl. 235-92.0FP.

Laven, Merrill L. Swimming pools with overflow gutters. 4,084,272, Cl. 4-172.170.

Lawrence, John P., to Goodyear Tire & Rubber Company, The. Inhibiting premature vulcanization of rubbers. 4,085,094, Cl. 260-79.50B.

Lawson, Alastair: *See*—
Green, Keith; and Lawson, Alastair, 4,085,428, Cl. 360-99.000.

Lawson, Thomas E., to Lexington Instrument Corporation. Galvanic cell assembly for detecting oxygen and method of making said cell. 4,085,024, Cl. 204-195.00R.

Lawton, James: *See*—
Simpson, David Preston; and Lawton, James, 4,085,170, Cl. 261-1.000.

Leamy, Harry John: *See*—
Augis, Jacques Armand; Chen, Ho Sou; and Leamy, Harry John, 4,085,396, Cl. 337-290.000.

Lecoffre, Yves, to Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A. Method of simulating cavitation by hydraulic testing. 4,084,432, Cl. 73-148.000.

Lee, Shih-Ying; and Briefer, Dennis K., to Setra Systems, Inc. Capacitive pressure sensing device. 4,084,438, Cl. 73-706.000.

Leedom, Marvin Allan, to RCA Corporation. Video disc package. 4,084,691, Cl. 206-313.000.

Lehr, Erich: *See*—
Langbein, Adolf; Weber, Karl-Heinz; Bauer, Adolf; Boke, Karin; Lehr, Erich; and Kuhn, Franz Josef, 4,085,216, Cl. 424-263.000.

Lei, Kenneth P. V.: *See*—
Henrie, Thomas A.; Lindstrom, Roald E.; and Lei, Kenneth P. V., 4,085,017, Cl. 204-123.000.

Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich. Apparatus for electrochemical machining of workpieces. 4,085,025, Cl. 204-224.00M.

LePage, Jean-Francois: *See*—
Juguin, Bernard; Cosyns, Jean; LePage, Jean-Francois; and Miquel, Jean, 4,085,157, Cl. 260-673.000.

Lepow, Mark Norman, to American Security Equipment Company. Foil terminal block. 4,084,879, Cl. 339-198.0GA.

Leprino Cheese Co.: *See*—
Reinbold, George W.; and Reddy, Malireddy S., 4,085,228, Cl. 426-36.000.

Leroy, Jean Marie Louis; and Pechmeze, Jacques Pierre Edmond, to Produits Chimiques Ugine Kuhlmann. Water-insoluble nitrophenylazophenyl compounds containing a terminal —N—$(CH_2)_n$—O—CO— or —CO—O—CH_2—CH_2—C_nF_5 group. 4,085,099, Cl. 260-207.000.

Leslar, David Louis; and Kirk, John Cyril, to Alarmco Inc. Combination alarm and automatic telephone answering system. 4,085,292, Cl. 179-2.00A.

Leslie, Donald James. Selective high frequency compression device for speaker system. 4,084,474, Cl. 84-1.270.

Lev, Kenneth D.: *See*—
Gravina, Anthony N.; Lev, Kenneth D.; and Angst, Arthur H., 4,085,363, Cl. 324-162.000.

Levielle, Jean, to Teinturerie de Champagne. Apparatus for dyeing textile lengths. 4,084,412, Cl. 68-5.00C.

Lewis, Donald J.: *See*—
Motyka, Jerry J.; and Lewis, Donald J., 4,084,676, Cl. 194-87.000.

Lewis, Frederick M. Locking ring for a castellated nut. 4,084,630, Cl. 151-5.000.

Lewis, John Didwith, to Imperial Chemical Industries Limited. Amplifiers. 4,085,381, Cl. 330-147.000.

Lewis, Richard, to British Steel Corporation. Rotary ultrasonic testing apparatus. 4,084,444, Cl. 73-622.000.

Lewis, Sheldon N.; and Miller, John J., to Rohm and Haas Company. Carboxylic polymeric thickeners. 4,085,167, Cl. 260-885.000.

Lexington Instrument Corporation: *See*—
Lawson, Thomas E., 4,085,024, Cl. 204-195.00R.

Leybold-Heraeus GmbH & Co. Kommandit-Gesellschaft: *See*—
Wechsung, Reiner; and Kirschner, Jurgen, 4,085,022, Cl. 204-192.00E.

Liaukus, Sigitas Julius; and Jen, Dixson Teh-Chao, to Bunker Ramo Corporation. Data display system designed as a microcontroller. 4,085,442, Cl. 364-900.000.

Lichius, Kenneth Walter, to White-Westinghouse Corporation. Laminated stator core. 4,085,347, Cl. 310-259.000.

Life Savers, Inc.: *See*—
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,085,227, Cl. 426-3.000.

Lifshits, Viktor Senderovich: *See*—
Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Koltyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna, 4,084,484, Cl. 90-24.00C.

Linde AG: *See*—
Schneeberger, Martin; and Wittmann, Dieter, 4,084,546, Cl. 122-32.000.

Linden-Alimak AB: *See*—
Juvonen, Vaino Esko, 4,084,486, Cl. 91-276.000.

Lindsey, Joseph W., to Arbrook, Inc. Fluid heating apparatus. 4,084,587, Cl. 128-193.000.

Lindstrom, Richard S.: *See*—
Prior, William L.; and Lindstrom, Richard S., 4,084,982, Cl. 106-105.000.

Lindstrom, Rikard Emanuel. Arrangement for mouldering organic waste material. 4,084,269, Cl. 4-111.000.

Lindstrom, Roald E.: *See*—
Henrie, Thomas A.; Lindstrom, Roald E.; and Lei, Kenneth P. V., 4,085,017, Cl. 204-123.000.

Linear Technology Inc.: *See*—
Barber, Herbert Douglas; and Salter, Gary Curtis, 4,085,382, Cl. 330-262.000.

Linn, John Charles, to Texas Instruments Incorporated. Magnetic domain memory employing all-bubble logic elements. 4,085,452, Cl. 365-5.000.

Lippits, Gerardus Johannes Meinardus; Janssen, Petrus Johannes; Debruijn, Henricus Antonius; and van Ruler, Johannes, to U.S. Philips Corporation. Method of manufacturing printed circuit boards. 4,085,285, Cl. 174-68.500.

Lippits, Gerardus Johannes Meinardus: *See*—
Janssen, Casper Johannes Gerardus Ferdinand; Postma, Lambertus; and Lippits, Gerardus Johannes Meinardus, 4,084,968, Cl. 96-48.0PD.

Lissant, Kenneth J., to Petrolite Corporation. Emulsions of enhanced ignitibility. 4,084,940, Cl. 44-51.000.

Lister, William. Pneumatic percussion hammer. 4,084,647, Cl. 173-73.000.

Littlewood, Peter Stuart: *See*—
Mercer, Alec Victor; Littlewood, Peter Stuart; Bolton, Ivan Joseph; and Fleck, Fritz, 4,085,101, Cl. 260-239.900.

Litvinenko, Alexandr Fedorovich: *See*—
Kaminsky, Igor Viktorovich; Shestakov, Vladimir Vladimirovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; Litvinenko, Alexandr Fedorovich; Melnikov, Viktor Vasilievich; Zats, Boris Semenovich; Miropolsky, Mark Usherovich; and Maizlik, David Lvovich, 4,085,051, Cl. 210-333.00R.

Liu, Chia-tsun, to Westinghouse Electric Corporation. Non-chromate pitting and general corrosion inhibitors for aluminum products and method. 4,085,063, Cl. 252-387.000.

Liu, Ke-Tien: *See*—
Nack, Herman; and Liu, Ke-Tien, 4,084,545, Cl. 122-4.00D.

Locatelli, Jean Louis: *See*—
Gruffaz, Max; and Locatelli, Jean Louis, 4,085,164, Cl. 260-858.000.

Lodi, Robert J., to Sperry Rand Corporation. Decoder buffer circuit for MNOS memory. 4,085,460, Cl. 365-230.000.

Loesche Hartzerkleinerungs-und Zementmaschinen GmbH & Co. KG: *See*—
Brundiek, Horst, 4,084,754, Cl. 241-52.000.

Lohr, Raymond J. Pedal car. 4,084,836, Cl. 280-254.000.

Lomax, George F., Jr.; and Coleman, Arthur A., to Hercules Incorporated. Manufacture of solid propellant. 4,085,173, Cl. 264-3.00R.

Lonza, Ltd.: *See*—
Stefani, Giancarlo; and Fontana, Pietro, 4,085,122, Cl. 260-346.750.

Looney, John H., to Xerox Corporation. Sheet stacking apparatus. 4,084,809, Cl. 271-220.000.

L'Oreal: *See*—
Kalopissis, Gregoire, 4,085,217, Cl. 424-266.000.

Lorenz, Achim R., to MacMillan Bloedel Limited. Two-piece shipping containers. 4,084,740, Cl. 229-23.00R.

Loutfy, Raouf O.: *See*—
Janjua, Mohammad Barakat Ilahi; Claessens, Pierre L.; and Loutfy, Raouf O., 4,085,916, Cl. 204-104.000.

Lovell, Walter: *See*—
Grise, Frederick G. J.; and Lovell, Walter, 4,085,333, Cl. 290-2.000.

Lozeau, Paul R.: *See*—
Pylant, John D.; Lozeau, Paul R.; and Packard, Newton R., 4,084,503, Cl. 101-96.000.

Lucchitta, Elio. Portable storage apparatus. 4,084,702, Cl. 211-88.000.

Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Counter pumping debris excluder and separator. 4,084,825, Cl. 277-25.000.

Luebbers, Herman E. Chain link assembly and disassembly tool. 4,084,369, Cl. 59-7.000.

Luehman, Kent W.: *See*—
Salesky, Emery; and Luehman, Kent W., 4,085,340, Cl. 307-237.000.

Lummus, J. Frank. Moving display rack. 4,084,868, Cl. 312-268.000.

Lumpkin, Robert E.: *See*—
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; Knell, Everett W.; Mirza, Zia I.; and Winter, Bruce L., 4,085,030, Cl. 208-8.000.

Luria, David. Piston-type internal combustion engine. 4,084,557, Cl. 123-90.150.

Luthi, Oscar, to Ingersoll-Rand Company. Pressure pulp washer with pivoted baffle. 4,085,003, Cl. 162-259.000.

Lymar, Wasyl; and Manley, Alice Jean. Sliding door and window stop. 4,084,290, Cl. 16-96.00R.

Lysanov, Vladislav Sergeevich: *See*—
Farafontov, Vladimir Ivanovich; Kalashnikov, Yaroslav Alexeevich; Novikov, Jury Nikolaevich; Volpin, Mark Efimovich; Vereschagin, Leonid Fedorovich; and Lysanov, Vladislav Sergeevich, 4,085,196, Cl. 423-446.000.

M&T Chemicals Inc.: *See*—
Dworkin, Robert Dally; and Ejk, Adam Joseph, 4,085,077, Cl. 260-23.0XA.
Russo, Robert V., 4,085,072, Cl. 260-2.5AC.

MacFarland, Charles H., to Scott & Fetzer Company, The. Vacuum cleaner filter bag assembly. 4,084,948, Cl. 55-366.000.

Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, to Life Savers, Inc. Long-lasting flavored chewing gum. 4,085,227, Cl. 426-3.000.

MacKenzie, Burton Thornley, Jr.; and Wilkus, Edward Vincent, to General Electric Company. Polyolefin with phosphorylated novolac and triallyl cyanurate. 4,085,162, Cl. 260-848.000.

MacKenzie, Raymond W.; Wood, Peter; Heinrich, Theodore M.; and Oates, Robert M., to White-Westinghouse Corporation, Inc. Frequency controlled induction cooking apparatus. 4,085,300, Cl. 219-10.49R.

MacMillan Bloedel Limited: *See*—
Brears, John H., 4,084,356, Cl. 51-328.000.
Lorenz, Achim R., 4,084,740, Cl. 229-23.00R.

Madarasz, Miklos: *See*—
Laserson, Gregory L.; and Madarasz, Miklos, 4,084,870, Cl. 339-18.00P.

Maddock, James W.: *See*—
Teter, Robert D.; Maddock, James W.; and Rothers, Paul L., 4,084,439, Cl. 73-718.000.

Madzay, Delbert R.: *See*—
Washnock, Robert S.; and Madzay, Delbert R., 4,084,813, Cl. 272-106.000.

Maeda, Keisuke; and Yamanaka, Akira, to Minolta Camera Kabushiki Kaisha. Photoflash mounting automatic light control camera. 4,085,410, Cl. 354-21.000.

Maeda, Takeshi: *See*—
Tsunoda, Yoshito; Maeda, Takeshi; and Oshida, Yoshitada, 4,085,423, Cl. 358-128.000.

Magee, Ramon J.: *See*—
Brown, William E.; Magee, Ramon J.; and McCoy, Dennis R., 4,084,500, Cl. 101-28.000.

Maggioni & C. S.p.A.: *See*—
Carissimi, Massimo; Ravenna, Franco; and Cantarelli, Giorgio, 4,085,223, Cl. 424-278.000.

Mahrer, Francois-Regis. Single-handle mixing valve. 4,084,611, Cl. 137-454.200.

Maier, Bruce R., to Discwasher, Inc. Apparatus for applying lubricating and protective film to phonograph records. 4,084,540, Cl. 118-48.000.

Maillefer, Charles E., to Maillefer S.A. Screw-type plastics extruder. 4,085,461, Cl. 366-90.000.

Maillefer S.A.: *See*—
Maillefer, Charles E., 4,085,461, Cl. 366-90.000.

Maisel, Klaus: *See*—
Ansberg, Chris; and Maisel, Klaus, 4,085,357, Cl. 318-590.000.

Maizlik, David Lvovich: *See*—
Kaminsky, Igor Viktorovich; Shestakov, Vladimir Vladimirovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; Litvinenko, Alexandr Fedorovich; Melnikov, Viktor Vasilievich; Zats, Boris Semenovich; Miropolsky, Mark Usherovich; and Maizlik, David Lvovich, 4,085,051, Cl. 210-333.00R.

Makeev, Boris Anatolievich: *See*—
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.

Malek, John M. Method for separating liquid and solid products of liquefaction of coal or like carbonaceous materials. 4,085,029, Cl. 208-8.000.

Malkiel, Saul Leon: *See*—
Galuschak, George; and Malkiel, Saul Leon, 4,085,375, Cl. 328-160.000.

Mallams, Alan K.; and Davies, David Huw, to Schering Corporation. Process for preparing 4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitols and novel 1-epimers and 1-N-alkyl derivatives produced thereby; methods for the use of the 1-epimer derivatives as antibacterial agents and compositions useful therefor. 4,085,208, Cl. 424-180.000.

Maness, Dale D.: *See*—
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 4,085,195, Cl. 423-244.000.

Manley, Alice Jean: *See*—
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Manowitz, Milton: *See*—
Virgilio, Joseph A.; and Manowitz, Milton, 4,085,062, Cl. 252-300.000.

Manring, John M.: *See*—
Krygeris, Algirdas J.; and Manring, John M., 4,085,402, Cl. 340-163.000.

Marathon Oil Company: *See*—
Allred, Victor Dean, 4,084,640, Cl. 166-259.000.

Marceau, J. Arthur; Firminhac, Ralph H.; and Moji, Yukimori, to Boeing Company, The. Method for providing environmentally stable aluminum surfaces for adhesive bonding and product produced. 4,085,012, Cl. 204-38.00A.

Marcel Golay: *See*—
Golay, Marcel J. E., 4,084,574, Cl. 126-270.000.

Margueratt, Oatway, to Seeburn Metal Products Limited. Resiliently four-way tiltable vehicle jack base. 4,084,791, Cl. 254-101.000.

Marion, Sebastino T. Batter training safety jacket. 4,084,264, Cl. 2-2.000.

Marquard, Kurt: *See*—
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Marsh, Lee M., Jr.: *See*—
Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., 4,085,324, Cl. 250-320.000.

Marshall, Hugh G., to Midland-Ross Corporation. Heat recovery and heat distributing apparatus. 4,084,635, Cl. 165-107.000.

Marsiat, Arthur, to U C B, Societe Anonyme. Process for the preparation of powdered thermosetting compositions based on branched-chain carboxyl group-containing polyesters and epoxy compounds. 4,085,159, Cl. 260-835.000.

Martin, Andre: *See*—
Heyraud, Marc; and Martin, Andre, 4,084,502, Cl. 101-93.290.

Martin, James C.: *See*—
Irick, Gether, Jr.; Kelly, Charles A.; and Martin, James C., 4,085,089, Cl. 260-45.8NT.

Martin, Michael D. Anti-theft device for automobile doors. 4,084,414, Cl. 70-181.000.

Maryland Cup Corporation: *See*—
Epple, Richard R., 4,084,729, Cl. 222-307.000.

Mashimo, Michiya; and Shinada, Hidehiro, to Tokyo Shibaura Electric Co., Ltd. Method for manufacture of lamp bulbs. 4,084,871, Cl. 316-19.000.

Maso-Therm Corporation: *See*—
Piazza, Matthew R., 4,084,362, Cl. 52-309.200.

Massachusetts Institute of Technology: *See*—
Grant, Nicholas J.; and Robinson, Ramon K., 4,084,964, Cl. 75-171.000.

Masuda, Yougoro; and Kawase, Shigeru, to Kanebo Ltd. Toner for electrostatic printing of sheet like materials containing triazine antistatic agent. 4,085,057, Cl. 252-62.10P.

Mathisen, Einar Skau, to International Business Machines Corporation. Drum monochromator. 4,084,909, Cl. 356-188.000.

Matovich, Mitchel J., Jr. Method of forming carton. 4,084,489, Cl. 93-36.800.

Matsubara, Ichiro: *See*—
Shinohara, Katsuhiko; Kuramochi, Yoshinori; Suehiro, Tetsuo; and Matsubara, Ichiro, 4,085,334, Cl. 307-11.000.

Matsuda, Shimpei: *See*—
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.

Matsudo, Kazuo; Shimomura, Takayoshi; and Kurokawa, Teruo, to Nippon Kokan Kabushiki Kaisha. Enameled cold rolled sheet. 4,084,991, Cl. 148-31.500.

Matsumoto, Masakazu: *See*—
Kitashima, Riichi; Matsumoto, Masakazu; and Tagaki, Shinji, 4,084,473, Cl. 84-1.140.

Matsumoto, Osamu: *See*—
Terajima, Yasuhiko; and Matsumoto, Osamu, 4,084,807, Cl. 271-119.000.

Matsuo, Teruo: *See*—
Yamamoto, Satomi; Yoshii, Masataka; Matsuo, Teruo; and Yokoozi, Teruo, 4,084,959, Cl. 75-53.000.

Matsushita, Takao: *See*—
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, 4,085,236, Cl. 427-121.000.

Matsushita, Takeshi: *See*—
Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Hayashi, Hisao, 4,084,986, Cl. 148-1.500.

Matsuzaka Iron Works, Inc.: *See*—
Nakamura, Masahiko; and Itou, Hidehiko, 4,084,317, Cl. 30-94.000.
Mattes, Bernhard: *See*—
Abend, Karl-Ludwig; Mattes, Bernhard; and Scheyhing, Hans, 4,084,659, Cl. 180-105.00E.
Matthews, Billy H. Collapsible temporary outdoor enclosure. 4,084,599, Cl. 135-4.00R.
Matthews, Richard L.: *See*—
Hightower, James O.; Hamner, James W.; and Matthews, Richard L., 4,084,992, Cl. 149-17.000.
Matthews, Russell Byron; and Hayes, Thomas Edward, to Johnson Controls, Inc. Interlock arrangement for a stack damper control. 4,084,743, Cl. 236-1.00G.
Maximov, Gennady Konstantinovich: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.
May, Bob. Tooth brush. 4,084,280, Cl. 15-22.00R.
Mayfield, Alfred B. Radial misalignment coupling. 4,084,411, Cl. 64-19.000.
Mazza, Bud: *See*—
Ehernberger, John E.; and Mazza, Bud, 4,084,496, Cl. 100-35.000.
McCallum, John, to Electro-Chlor Corporation. Electrolytic chlorination device. 4,085,028, Cl. 204-269.000.
McCarty, Charles Bruce: *See*—
Murphy, Alan Pearce; Seiden, Paul; Diehl, Francis Louvaine; and McCarty, Charles Bruce, 4,085,052, Cl. 252-8.600.
McCombs, William F.: *See*—
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McConnell, Robert B.; and Keuer, Douglas W., to Ashland Oil, Inc. Fatty alkanolamide detergent compositions. 4,085,126, Cl. 260-404.000.
McConnell, Robert G., to Woodward Governor Company. Frequency-to-voltage transducer for speed governor systems or the like. 4,085,373, Cl. 328-141.000.
McConway & Torley Corporation: *See*—
Oshinsky, Frank W.; and Brown, Thomas R., Sr., 4,084,705, Cl. 213-127.000.
McCoy, Dennis R.: *See*—
Brown, William E.; Magee, Ramon J.; and McCoy, Dennis R., 4,084,500, Cl. 101-28.000.
McCoy, John H.; and Sullivan, Paul A., to Hughes Aircraft Company. Hard X-ray and fluorescent X-ray detection of alignment marks for precision mask alignment. 4,085,329, Cl. 250-492.00A.
McDevitt, Robert F., to Penfold, Charles S. Device for obtaining a sample of molten material and deoxidizing element for use therewith. 4,084,441, Cl. 73-425.40R.
McDonald, Charles H. Low viscosity asphalt-rubber paving material. 4,085,078, Cl. 260-28.5AS.
McDonald, James A.: *See*—
Kerwin, Daniel; Zoberis, Walter B.; Grec, John W.; and McDonald, James A., 4,084,501, Cl. 101-76.000.
McEachern, Charles M. Stabilized dental implant. 4,084,318, Cl. 32-10.00A.
McFarland, Douglas. Round bale loading and unrolling machine. 4,084,707, Cl. 214-1.0HA.
McFarland, Robert Henry, to Tappan Company, The. See-through oven door with reticulated heat shield. 4,084,571, Cl. 126-198.000.
McGarry, John James, Sr.; and Jules, Samuel Edward. Apparatus for producing packing rings for fluid systems and the like. 4,084,929, Cl. 425-169.000.
McGarry, John James, Sr.: *See*—
Jules, Samuel Edward; and McGarry, John James, Sr., 4,085,184, Cl. 264-219.000.
McGrath, Laurence R., to Allis-Chalmers Corporation. Arbor assembly for rotary mowers. 4,084,397, Cl. 56-255.000.
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Spotts, Willard; Arrandale, Thomas P.; and Spotts, Glenn R., 4,084,491, Cl. 98-121.00A.
McIntyre, Robert Alfred; and Wolverton, Kenneth Harlan, to Ametek, Inc. Safety double protection device for machines having plural circuit breaker assemblies associated with doffer roller and hand guard. 4,085,303, Cl. 200-61.410.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted aminosulfonylamino pyridine thiocarboxylic acids and derivatives thereof. 4,085,278, Cl. 544-111.000.
McKendry, Lennon H., to Dow Chemical Company, The. Substituted (aminosulfonylamino) pyridine carboxylic acids and derivatives thereof. 4,085,279, Cl. 544-111.000.
McMurtry, David Roberts, to Rolls-Royce Limited; and Renishaw Electrical Limited. Measuring apparatus. 4,084,323, Cl. 33-174.00L.
McNeely, Michael Lee; and Rees, Herbert, to RCA Corporation. Method for producing injection molded and centrally apertured disc records. 4,085,178, Cl. 264-106.000.
Mead Corporation, The: *See*—
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Paranjpe, Suresh C., 4,085,409, Cl. 346-75.000.
Measuregraph Company, The: *See*—
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Mechlowitz, Bela: *See*—
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Asselman, George Albert Apolonia; Van der AA, Herman Henricus Maria; and Meijer, Roelf Jan, 4,084,376, Cl. 60-523.000.
Mein, Peter G.; and Adolf, Horst R., to Carus Corporation. Process for recovery of potassium from manganate plant wastes. 4,085,191, Cl. 423-208.000.
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Mess, Richard C., to Dayton Sure-Grip & Shore Company, The. Cavity forming plug for coil insert in concrete product. 4,084,780, Cl. 249-59.000.
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Metzger, William J., to Midland-Ross Corporation. Car coupler. 4,084,704, Cl. 213-100.00W.
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Michon, Pierre, to Societe d'Etudes de Machines Thermiques. Flexible coupling device. 4,084,410, Cl. 64-12.000.
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Milberger, Ernest C.; Bremer, Noel J.; and Wong, Eunice K. T., to Standard Oil Company, The. Preparation of maleic anhydride from four-carbon hydrocarbons using Ti, P, O, containing catalyst. 4,085,121, Cl. 260-346.750.
Miles, Charles M., to Walters, Paul F. Liquid flow activated switch. 4,085,336, Cl. 307-118.000.
Miles, Roscoe C.; Subrick, Joseph; and Talman, Woods G., to United States Steel Corporation. Water-driven air pumping and dust-suppressing apparatus. 4,084,855, Cl. 299-64.000.
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plastic graft copolymers and their preparation. 4,085,168, Cl. 260-886.000.
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Miller, Norman L.: *See—*
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Schultz, Thomas E.; and Schuchardt, Peter W., 4,085,314, Cl. 235-487.000.
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Fukuwatari, Tadashi; Mishima, Kiyotaka; Ichimura, Hiroshi; and Kurihara, Hideaki, 4,085,001, Cl. 162-145.000.
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Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.
Misumi, Teruyuki; Miyaji, Toshio; and Kasai, Masao, to Asahi Kasei Kogyo Kabushiki Kaisha. Solid-fluid contacting process. 4,085,042, Cl. 210-33.000.
Mithoff, Oliver M. Motorcycle safety light. 4,085,317, Cl. 362-72.000.
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, to Minnesota Mining and Manufacturing Company. Poly(perfluoroalkylene oxide) derivatives. 4,085,137, Cl. 260-561.0HL.
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Yasuoka, Akihiko; and Shibata, Hiroshi, 4,084,311, Cl. 29-571.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Nakano, Tatsuya; Yasuda, Kazuyoshi; and Miwa, Takeshi, 4,084,760, Cl. 242-18.00A.
Mitsubishi Petrochemical Co. Ltd.: *See—*
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.
Mitsubishi Precision Co., Ltd.: *See—*
Kumazawa, Toshiharu, 4,084,934, Cl. 431-189.000.
Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Muruyama, Mikio, 4,084,528, Cl. 114-45.000.
Mitsui Petrochemical Industries Ltd.: *See—*
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, 4,085,276, Cl. 526-122.000.
Mittenzwei, Hellmut: *See—*
Wacker, Adolf; Wacker, Dorthe; Pohler, Klaus; and Mittenzwei, Hellmut, 4,085,204, Cl. 424-101.000.
Mittenzwei, Helmut: *See—*
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Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Fluid transfer device. 4,084,606, Cl. 137-102.000.
Mituhara, Toshihiko: *See—*
Kanbara, Takahiro; and Mituhara, Toshihiko, 4,084,463, Cl. 82-53.100.
Miura, Chiaki: *See—*
Kamada, Hidemoto; Miura, Chiaki; and Kano, Etsuo, 4,085,234, Cl. 426-618.000.
Miura, Mitsuo: *See—*
Kukino, Yoshinori; Miura, Mitsuo; and Aoyagi, Hayao, 4,084,383, Cl. 61-36.00R.
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Nakano, Tatsuya; Yasuda, Kazuyoshi; and Miwa, Takeshi, 4,084,760, Cl. 242-18.00A.
Miyaji, Toshio: *See—*
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Miyamoto, Yoji. Protective cover for spectacle joint. 4,084,888, Cl. 351-97.000.
Miyata, Shigeo; Hirose, Toru; and Iizima, Noriko, to Kyowa Chemical Industry Co., Ltd. Fire-retarding thermoplastic resin composition. 4,085,088, Cl. 260-45.70R.
Miyazaki, Mitsumasa: *See—*
Mizuno, Shioji; Ishikawa, Ryoichi; and Miyazaki, Mitsumasa, 4,085,086, Cl. 260-40.0TN.
Miyazawa, Takeshi: *See—*
Sato, Kazunobu; Suzuki, Takanori; Kobayashi, Tadataka; and Miyazawa, Takeshi, 4,084,568, Cl. 123-182.000.
Mizuno, Minesilo: *See—*
Kawakami, Takajiro; Mizuno, Minesilo; Okushi, Akira; and Yasuda, Michio, 4,085,237, Cl. 427-150.000.
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Mizutani, Yutaka; and Aoki, Takashi, to Kensetsu Kikai Chosa Kabushiki Kaisha. Vibrator equipped grab bucket. 4,084,336, Cl. 37-184.000.
Mobil Oil Corporation: *See—*
Frilette, Vincent J.; and Rubin, Mae K., 4,085,156, Cl. 260-671.00R.
Moehlenpah, Walter G. Apparatus for fabricating wood structures. 4,084,499, Cl. 100-231.000.
Moeller, Wolfgang W. Electric drill multi-functional apparatus. 4,085,337, Cl. 307-115.000.
Moertel, George B., to Textron Inc. Method of manufacture of oriented slide fastening element. 4,084,296, Cl. 24-205.130.
Mogerlein, Heinrich; and Moser, Werner, to Fa. J. N. Eberle & Cie. GmbH. Device for winding up a belt or web. 4,084,764, Cl. 242-107.000.
Mogi, Takao; Morita, Koji; and Okada, Hisao, to Sony Corporation. Automatically tuned memory television channel selecting apparatus. 4,085,371, Cl. 325-464.000.
Mogi, Takao; and Okada, Hisao, to Sony Corporation. Channel selecting apparatus for a television receiver with an electronic tuner. 4,085,372, Cl. 325-464.000.
Mohrbacker, William J.; and Thayer, Earl C., to Rexnord Inc. Castered load transfer axle stabilizer. 4,084,833, Cl. 280-81.00A.
Moineau, Hubert J., to Automatic Specialties, Inc. Method of fabricating a pot hanger. 4,084,624, Cl. 140-80.000.
Moineau, Hubert J., to Automatic Specialties, Inc. Pot hanger. 4,084,779, Cl. 248-318.000.
Moji, Yukimori: *See—*
Marceau, J. Arthur; Firminhac, Ralph H.; and Moji, Yukimori, 4,085,012, Cl. 204-38.00A.
Molnar, Frank. Multi-purpose vehicle service hoist. 4,084,790, Cl. 254-90.000.
Molycorp, Inc.: *See—*
Kay, D. Alan R.; and Wilson, William G., 4,084,960, Cl. 75-58.000.
Mommeja, Patrick F.: *See—*
Laignel, Raymond A.; and Mommeja, Patrick F., 4,084,608, Cl. 137-316.000.
Monsanto Company: *See—*
Elbert, Donald Lee, 4,085,080, Cl. 260-31.20N.
Franz, John E., 4,084,953, Cl. 71-86.000.
Gambell, James W.; and Tinker, H. Burnham, 4,085,275, Cl. 560-130.000.
Hahn, Frank J.; and Santer, James O., 4,085,242, Cl. 427-385.00R.
Kmetz, Richard C.; and Miner, Leland P., 4,085,079, Cl. 260-29.60B.

Montclair Research Corporation: *See*—
Grossman, Harold, 4,084,596, Cl. 131-17.00R.
Monte, George Leendert Adriaan, to U.S. Philips Corporation. X-ray examining device. 4,085,328, Cl. 250-416.0TV.
Mooi, John: *See*—
Gallagher, James P.; and Mooi, John, 4,085,068, Cl. 252-455.00R.
Moore, Alvin Edward. Light-weight, insulated, can-comprising construction member. 4,084,363, Cl. 52-309.400.
Morgardshammar Aktiebolag: *See*—
Karlberger, Walter Johann, 4,084,421, Cl. 72-231.000.
Karlberger, Walter Johann, 4,084,797, Cl. 266-106.000.
Mori, Koh: *See*—
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,085,090, Cl. 260-49.000.
Mori, Toshikatsu: *See*—
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.
Morinaga, Tsuyoshi: *See*—
Takahashi, Katuhiko; Arimoto, Kyozo; Arai, Yoshiyuki; Morinaga, Tsuyoshi; and Nakazawa, Yuji, 4,085,274, Cl. 560-176.000.
Morishita, Seishi, to Toyo Umpanki Co., Ltd. Inching control system for industrial vehicles. 4,084,670, Cl. 192-13.00R.
Morita, Kaneji: *See*—
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.
Morita, Koji: *See*—
Mogi, Takao; Morita, Koji; and Okada, Hisao, 4,085,371, Cl. 325-464.000.
Moritz, Werner, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Apparatus for fastening a covering on an energy conducting chain. 4,084,370, Cl. 59-78.100.
Morningstar, Marion George; and Bowles, Robert Lewis, to B. F. Goodrich Company, The. Process for the suspension polymerization of vinyl chloride with low polymer buildup. 4,085,267, Cl. 526-74.000.
Morris, Edwin, Jr.; and Toler, David F., to United Technologies Corporation. Means of attaching a seal to a disk. 4,084,919, Cl. 415-136.000.
Morris, Kenneth John; and Salovsky, Jan, to Olin Energy Systems, Ltd. Isostatic mold apparatus. 4,084,932, Cl. 425-405.00H.
Morton-Norwich Products, Inc.: *See*—
Pelosi, Stanford S., Jr., 4,085,118, Cl. 260-343.600.
Moscaritolo, Anthony Michael: *See*—
Ahn, Byong-Ho; Gilinson, Philip J., Jr.; and Moscaritolo, Anthony Michael, 4,084,428, Cl. 73-117.300.
Moscrip, William Matthew, to United States of America, Navy. Light-weight small craft gun system. 4,084,480, Cl. 89-42.00B.
Moser, Werner: *See*—
Mogerlein, Heinrich; and Moser, Werner, 4,084,764, Cl. 242-107.000.
Moses, Robert W., to Peterson Machine Tool, Inc. Valve cleaning machine. 4,084,357, Cl. 51-419.000.
Mosior, Donald J., to American Hospital Supply Corporation. Surgical instrument and handle assembly therefor. 4,084,594, Cl. 128-311.000.
Moss, James R., to Computer Peripherals, Inc. Ribbon tracking system. 4,084,683, Cl. 197-170.000.
Motokawa, Shoichi: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Motoki, Hideo, to Shikoku Kaken Kogyo Kabushiki Kaisha. Process for preparing a foamed body. 4,084,980, Cl. 106-75.000.
Motorola, Inc.: *See*—
Kirk, Glenn E.; and Medesha, Alfred L., 4,084,312, Cl. 29-588.000.
Reinert, John Robert, 4,085,341, Cl. 307-247.00R.
Ryan, Carl R.; and Stilwell, James H., 4,085,378, Cl. 329-124.000.
Motyka, Jerry J.; and Lewis, Donald J., to Tobias, Lamar. Token operated ice dispenser. 4,084,676, Cl. 194-87.000.
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich. Method of making self-twisted fibrous product from at least two strands. 4,084,400, Cl. 57-156.000.
Moyer, Norman E., to Hughes Aircraft Company. Timing circuit for display sequencing in a digital wristwatch. 4,084,402, Cl. 58-23.00R.
Moyer, Norman E.: *See*—
Belardi, Richard J.; Moyer, Norman E.; and Ho, Ernest C., 4,084,401, Cl. 58-4.00A.
Mueller, Heinrich: *See*—
Schmachtel, Florian; and Mueller, Heinrich, 4,084,390, Cl. 53-112.00A.
Mueller, Ruediger: *See*—
Goser, Karl; and Mueller, Ruediger, 4,085,339, Cl. 307-213.000.
Muhlfelder, Ludwig, to RCA Corporation. Roll/yaw body steering for momentum biased spacecraft. 4,084,772, Cl. 244-165.000.
Muhlfelder, Ludwig: *See*—
Schmidt, George Edwin, Jr.; and Muhlfelder, Ludwig, 4,084,773, Cl. 244-166.000.
Munier, Bernard, to Thomson-CSF. Electroacoustic device for reading an optical image in two dimensions. 4,085,348, Cl. 310-313.000.
Munkel, Hanns-Wilfried: *See*—
Kohler, Gisbert; Munkel, Hanns-Wilfried; Pohl, Hubert; Sommer, Walter; and Wendel, Gunther, 4,084,860, Cl. 308-15.000.
Muntz, Eric P.: *See*—
Hamel, Bernard B.; Muntz, Eric P.; and Scott, Paul B., 4,084,943, Cl. 55-17.000.
Murasaki, Hiroshi: *See*—
Ogawa, Masaya; and Murasaki, Hiroshi, 4,084,895, Cl. 355-1.000.
Murase, Shunichi: *See*—
Aoki, Mitsuo; Watanabe, Kazuhiko; Murase, Shunichi; and Hiraoka, Isao, 4,085,207, Cl. 424-180.000.
Murdock Machine & Engineering Company of Texas: *See*—
Herbert, John T.; Sullivan, Paul E.; and Vitt, Stanley P., Jr., 4,084,785, Cl. 251-172.000.
Murphy, Alan Pearce; Seiden, Paul; Diehl, Francis Louvaine; and McCarty, Charles Bruce, to Procter & Gamble Company, The. Fabric treatment compositions. 4,085,052, Cl. 252-8.600.
Murphy, Harry C., Jr.; and Stauffer, Harry C., to Gulf Research & Development Company. Process of hydrodesulfurization and separate solvent extraction of distillate and deasphalted residual lubricating oil fractions. 4,085,036, Cl. 208-212.000.
Murphy, Ian R.: *See*—
Bull, Jeffrey Lawrence; Murphy, Tanya Ellen; and Gibson, Laurence Ernest (said Tanya Ellen Murphy assors. to), 4,084,859, Cl. 303-106.000.
Murphy, Milo E., to Custom-Bilt. Tunable expansion chamber for internal combustion engines. 4,084,658, Cl. 181-241.000.
Murphy, Tanya Ellen: *See*—
Bull, Jeffrey Lawrence; Murphy, Tanya Ellen; and Gibson, Laurence Ernest, 4,084,859, Cl. 303-106.000.
Muruyama, Mikio: *See*—
Itani, Mituo; Kawashima, Hiroyuki; Inoue, Takasuke; and Muruyama, Mikio, 4,084,528, Cl. 114-45.000.
Muto, Masayuki; Tashima, Norio; Kaieda, Shozo; and Kamimura, Kuniaki, to Minolta Camera Kabushiki Kaisha. Liquid jet recording apparatus. 4,085,408, Cl. 346-75.000.
Myers, Bruce B., to Bendix Corporation, The. Method of constructing a valve. 4,084,304, Cl. 29-157.10R.
Myers, Robert F., to Pfizer Inc. 4-Substituted amino derivatives of oleandomycin. 4,085,119, Cl. 260-343.000.
N L Industries, Inc.: *See*—
Erneta, Modesto, 4,085,198, Cl. 423-498.000.
Naarding, Willem J., to Hergeth KG Maschinenfabrik und Apparatebau. Method and apparatus for quantitatively and qualitatively determining the dust content of fibrous material. 4,084,433, Cl. 73-159.000.
Nack, Herman; and Liu, Ke-Tien, to Battelle Development Corporation. Operating method. 4,084,545, Cl. 122-4.00D.
Nagahama, Yasuo, to Nippon Gakki Seizo Kabushiki Kaisha. Generator for generating control voltage waveform. 4,085,374, Cl. 328-143.000.
Nagamura, Fumitaka. Data storage and retrieval system. 4,085,446, Cl. 364-900.000.
Nagaoka, Shigenori: *See*—
Hagiwara, Tatsuo; Nomiyama, Fumihiro; and Nagaoka, Shigenori, 4,084,752, Cl. 241-30.000.
Nagayama, Keiji: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Naimo, Jean-Pierre, to A.T.M.B. Societe Anonyme. Guide rail for sliding panels, doors and the like. 4,084,289, Cl. 16-96.00R.
Nakagawa, Kiyoshi; Otaki, Yukio; Mineo, Masatoshi; Aratani, Yoshio; Tatsuoka, Yoshio; and Kusakabe, Haruhiko, to Toray Industries Inc. Textured polyester yarns and process for the production thereof. 4,084,622, Cl. 139-420.00R.
Nakagawa, Koji: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.
Nakai, Setsuo; Kita, Shinichiro; Hiki, Fumihiko; and Shimizu, Masayuki, to Sumitomo Chemical Company, Limited. Process for the high pressure production of polyethylene. 4,085,266, Cl. 526-65.000.
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, to Mitsubishi Petrochemical Co. Ltd.; Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Catalytic process for reducing nitrogen oxides to nitrogen. 4,085,193, Cl. 423-239.000.
Nakajima, Fumito: *See*—
Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased, 4,085,194, Cl. 423-242.000.
Nakajima, Yasuo: *See*—
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; Sugihara, Kunihiko; and Takagi, Yasuo, 4,084,372, Cl. 60-278.000.
Nakamura, Koichi; and Shimamura, Isao, to Fuji Photo Film Co., Ltd. Color photographic process. 4,084,969, Cl. 96-60.00R.
Nakamura, Masahiko; and Itou, Hidehiko, to Matsuzaka Iron Works, Inc. Shearing tool for synthetic resin tubes. 4,084,317, Cl. 30-94.000.
Nakanishi, Fumio: *See*—
Niwata, Tatuji; Okubo, Kazutomo; Nakanishi, Fumio; and Yamada, Masanori, 4,085,422, Cl. 358-118.000.
Nakano, Tatsuya; Yasuda, Kazuyoshi; and Miwa, Takeshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Transferring yarn in an automatic winder. 4,084,760, Cl. 242-18.00A.

Nakase, Takamichi: *See*—
Hattori, Tadashi; and Nakase, Takamichi, 4,084,558, Cl. 123-97.00B.
Hattori, Tadashi; Iwata, Toshiharu; and Nakase, Takamichi, 4,084,560, Cl. 123-119.0EC.
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,084,563, Cl. 123-119.0EC.
Nakatani, Mitsuo, to Hitachi, Ltd. Metal mask for use in screen printing. 4,084,506, Cl. 101-127.000.
Nakayama, Fukuzo, to Japan Non-Slip Pavement Co., Inc. Method of manufacturing non-slip pavement blocks. 4,085,176, Cl. 264-82.000.
Nakayama, Shinpei: *See*—
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,085,169, Cl. 260-886.000.
Nakazawa, Yuji: *See*—
Takahashi, Katuhiko; Arimoto, Kyozo; Arai, Yoshiyuki; Morinaga, Tsuyoshi; and Nakazawa, Yuji, 4,085,274, Cl. 560-176.000.
Nanbu, Junji: *See*—
Ariga, Nagao; Nanbu, Junji; and Oikawa, Hiroshi, 4,085,018, Cl. 204-159.150.
Nannen, William G. Working vehicle. 4,084,395, Cl. 56-15.400.
Narita, Kinichiro: *See*—
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.
Narushima, Hiroshi; and Hotta, Takayosi, to Okuma Machinery Works, Ltd. Automatic tool changing method and apparatus. 4,084,300, Cl. 29-26.00A.
National Can Corporation: *See*—
Sauer, Donald G., 4,085,177, Cl. 264-89.000.
National Casein of New Jersey: *See*—
Woo, Ming Cho, 4,085,074, Cl. 260-17.00R.
National Machinery Company, The: *See*—
Allebach, Gene E.; and Wisebaker, Robert E., 4,084,278, Cl. 10-76.00T.
National Research Development Corporation: *See*—
Fray, Derek John, 4,085,023, Cl. 204-195.00S.
National Semiconductor Corporation: *See*—
Ochi, Sam S., 4,085,417, Cl. 357-43.000.
NCR Canada Ltd. - NCR Canada Ltee: *See*—
Fairey, Brian M.; and Plasschaert, Paulus E., 4,084,682, Cl. 197-168.000.
Nelson, Lorne W., to Honeywell Inc. Refrigeration control system for optimum demand operation. 4,084,388, Cl. 62-152.000.
Nelson, Norman A., to Upjohn Company, The. 3(1'-Hydroxy-2'-hydroxyethyl)-4-hydroxy-6-silyloxyhexanoic acid 4clactone derivatives. 4,085,120, Cl. 260-343.600.
Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-aminomethyl-PGE and PGD analogs. 4,085,139, Cl. 260-563.00R.
Nelson, Terence John: *See*—
Bobeck, Andrew Henry; Bonyhard, Peter Istvan; and Nelson, Terence John, 4,085,453, Cl. 365-8.000.
Neptune Water Meter Company: *See*—
Kullmann, Donald J.; Seltzer, Daniel A.; and Kirby, Raymond L., 4,085,287, Cl. 178-66.00R.
Neumayr, Franz: *See*—
Daumiller, Guenther; Merkel, Karl; Neumayr, Franz; and Schneider, Kurt, 4,085,269, Cl. 544-221.000.
Neveu, Jean-Louis; and Melancon, Sylvio, to Melancon, Sylvio; and Agence Nationale de Valorisation de la Recherche. Apparatus for the production of a yarn having a potential crimp. 4,084,930, Cl. 425-198.000.
New York Institute of Technology: *See*—
Nigam, Anant K., 4,084,582, Cl. 128-2.00V.
Newby, Jack C. Tire inflation gauge. 4,084,431, Cl. 73-146.200.
Newton, Roger Frank: *See*—
Rhodes, Deryck; and Newton, Roger Frank, 4,085,222, Cl. 424-278.000.
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Nicewonger, Dwight Harold. Solar heater unit. 4,084,575, Cl. 126-270.000.
Nichols, Richard D. E.: *See*—
Bianchi, John E.; and Nichols, Richard D. E., 4,084,734, Cl. 224-2.00B.
Nicol, William A. Seed dispenser. 4,084,726, Cl. 221-266.000.
Nicolaides, Ernest D.: *See*—
Tinney, Francis John; and Nicolaides, Ernest D., 4,085,096, Cl. 260-112.5LH.
Nidy, Eldon G.: *See*—
Kornis, Gabriel; Nidy, Eldon G.; Vostral, Henry J.; and Steinhards, Arnolds, deceased, 4,084,955, Cl. 71-92.000.
Niederer, Floyd S., to Otto Niederer Sons, Inc. Egg weighing device. 4,084,698, Cl. 209-121.000.
Nielsen, Hans Borge, to Vald. Henriksen A/S. Apparatus for liquid treatment and drying of bobbins. 4,084,413, Cl. 68-189.000.
Nielsen, Tore Bernt; and Alm, Oddvar, to Dyno Industrier A.S. Aqueous hydrocarbon oil-soluble lignosulphonate explosive composition. 4,084,994, Cl. 149-44.000.
Nigam, Anant K., to New York Institute of Technology. Ultrasonic imaging system. 4,084,582, Cl. 128-2.00V.
Niimi, Koji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with tone generation by recursive calculation. 4,084,472, Cl. 84-1.010.
Nikonets, Leonid Alexeevich: *See*—
Genrikh, Georgy Andreevich; Nikonets, Leonid Alexeevich; and Genrikh, Natalia Georgievna, 4,085,338, Cl. 307-147.000.
Nippon Carbon Kabushiki Kaisha: *See*—
Kanemaru, Toyonusuke; Hisatomi, Yukuo; and Nishimoto, Takafumi, 4,084,399, Cl. 57-140.00C.
Nippon Concrete Kogyo Kabushiki Kaisha: *See*—
Okada, Senri, 4,084,782, Cl. 249-135.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nagahama, Yasuo, 4,085,374, Cl. 328-143.000.
Niimi, Koji, 4,084,472, Cl. 84-1.010.
Nippon Hoso Kyokai: *See*—
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.
Nippon Kogaku K.K.: *See*—
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Nippon Kokan Kabushiki Kaisha: *See*—
Matsudo, Kazuo; Shimomura, Takayoshi; and Kurokawa, Teruo, 4,084,991, Cl. 148-31.500.
Nippon Oil Company, Limited: *See*—
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,263, Cl. 526-47.000.
Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, 4,085,265, Cl. 526-49.000.
Tsuchiya, Shozo; Hayashi, Hideo; Iida, Kazuyoshi; and Goto, Kiyoshi, 4,085,085, Cl. 260-38.000.
Nippon Otis Elevator Company: *See*—
Tezuka, Minoru; and Kito, Yastami, 4,084,662, Cl. 187-29.00R.
Nippon Soken, Inc.: *See*—
Hattori, Tadashi; and Nakase, Takamichi, 4,084,558, Cl. 123-97.00B.
Hattori, Tadashi; Iwata, Toshiharu; and Nakase, Takamichi, 4,084,560, Cl. 123-119.0EC.
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,084,563, Cl. 123-119.0EC.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,084,551, Cl. 123-32.0SP.
Sasakura, Hachiro; and Kanmura, Hitoshi, 4,084,548, Cl. 123-205.000.
Takagi, Shigeru; and Hattori, Yoshiyuki, 4,084,839, Cl. 280-736.000.
Nippon Steel Corporation: *See*—
Yamamoto, Satomi; Yoshii, Masataka; Matsuo, Teruo; and Yokoozi, Teruo, 4,084,959, Cl. 75-53.000.
Nippon Unicar Company Limited: *See*—
Taniguchi, Seiho; Kawasaki, Yoichi; and Sugawara, Shin' Ichi, 4,085,249, Cl. 428-383.000.
Nippondenso Co., Ltd.: *See*—
Hachiga, Takasi, 4,084,567, Cl. 123-148.00E.
Nisenson, Jules: *See*—
Aasen, Torulf F.; Nisenson, Jules; and Pegg, Charles E., 4,084,901, Cl. 355-16.000.
Nishida, Hiroshi: *See*—
Fujiura, Takashi; Tsutsui, Kunio; and Nishida, Hiroshi, 4,084,531, Cl. 114-211.000.
Nishimoto, Takafumi: *See*—
Kanemaru, Toyonusuke; Hisatomi, Yukuo; and Nishimoto, Takafumi, 4,084,399, Cl. 57-140.00C.
Nishimura, Hidetomo: *See*—
Hasegawa, Kunio; Nishimura, Hidetomo; and Yamaguchi, Kiyoshi, 4,085,343, Cl. 310-52.000.
Nissan Motor Company, Limited: *See*—
Handa, Noritoshi, 4,084,634, Cl. 165-9.000.
Tojo, Akio; and Ohnishi, Kimimasa, 4,084,623, Cl. 139-435.000.
Niwata, Tatuji; Okubo, Kazutomo; Nakanishi, Fumio; and Yamada, Masanori, to Hokuryo Denko Co., Ltd. Fee-charging apparatus for television sets. 4,085,422, Cl. 358-118.000.
Noda, Taizo, to Kohshoh Limited. Plastic clip. 4,084,299, Cl. 24-250.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine. 4,084,551, Cl. 123-32.0SP.
Nohara, Akira; Ishiguro, Toshihiro; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. Novel chromone derivatives. 4,085,116, Cl. 260-308.00D.
Nohynek, Miroslav: *See*—
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.
Nomiyama, Fumihiro: *See*—
Hagiwara, Tatsuo; Nomiyama, Fumihiro; and Nagaoka, Shigenori, 4,084,752, Cl. 241-30.000.
Nomura, Masaaki: *See*—
Ishida, Tsutomu; Nomura, Masaaki; and Ohta, Wasaburo, 4,084,899, Cl. 355-14.000.

Noordanus, Johannes: *See—*
van der Poel, Johannes; and Noordanus, Johannes, 4,085,370, Cl. 325-348.000.

Noranda Mines Limited: *See—*
Janjua, Mohammad Barakat Ilahi; Claessens, Pierre L.; and Loutfy, Raouf O., 4,085,016, Cl. 204-104.000.

Nordischer Maschinenbau Rud. Baader: *See—*
Dohrendorf, Franz, 4,084,294, Cl. 17-57.000.

Nordling, Karl I.: *See—*
Walsh, Dale M.; and Nordling, Karl I., 4,085,449, Cl. 364-900.000.

Norgate, Graham: *See—*
Bertram, Robert W.; Norgate, Graham; and Isles, Robert, 4,085,398, Cl. 338-25.000.

North American Galis Company: *See—*
Galis, Alex J., 4,084,751, Cl. 241-25.000.

Norton Company: *See—*
Cox, William H.; and Wisdom, Norvell E., Jr., 4,084,941, Cl. 51-295.000.

Norz, Gerald R. Windmill with cyclically feathering blades. 4,084,921, Cl. 416-17.000.

Nottoli, Le Roi G. Backgammon teaching device. 4,084,331, Cl. 35-8.00R.

Novikov, Jury Nikolaevich: *See—*
Farafontov, Vladimir Ivanovich; Kalashnikov, Yaroslav Alexeevich; Novikov, Jury Nikolaevich; Volpin, Mark Efimovich; Vereschagin, Leonid Fedorovich; and Lysanov, Vladislav Sergeevich, 4,085,196, Cl. 423-446.000.

Numbers, Jody L. Gun sight. 4,084,326, Cl. 33-245.000.

Nuova San Giorgio S.p.A.: *See—*
Piro, Mario, 4,084,759, Cl. 242-18.0PW.

Oates, Robert M.: *See—*
MacKenzie, Raymond W.; Wood, Peter; Heinrich, Theodore M.; and Oates, Robert M., 4,085,300, Cl. 219-10.49R.

O'Brien, Charles J., to Aerojet-General Corporation. Tritiated water treatment process. 4,085,061, Cl. 252-301.10W.

O'Brien, David Frank, to Eastman Kodak Company. Photographic elements containing vesicles of rhodopsin and lipids. 4,084,967, Cl. 96-29.00R.

Occidental Petroleum Corporation: *See—*
Green, Norman W.; Duraiswamy, Kandaswamy; Lumpkin, Robert E.; Kneli, Everett W.; Mirza, Zia I.; and Winter, Bruce L., 4,085,030, Cl. 208-8.000.

Ochi, Sam S., to National Semiconductor Corporation. JFET switch circuit and structure. 4,085,417, Cl. 357-43.000.

Odaka, Fumio; Fujii, Yoshihiko; and Iseda, Yutaka, to Bridgestone Tire Co., Ltd. Polyurethane composition. 4,085,165, Cl. 260-859.00R.

Odawara, Kiyoshi: *See—*
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, 4,085,276, Cl. 526-122.000.

Odle, Herbert Arnold; Ruehl, Donald Edward; Shadwick, Jan; Sullivan, Daryl Dean; and Welty, Dale Eugene, to Johns-Manville Corporation. Luminaire and luminaire reflector for use in an off-the roadway lighting arrangement. 4,085,318, Cl. 362-217.000.

Oe, Takanori; and Tsuruda, Mineo, to Yoshitomi Pharmaceutical Industries, Ltd. 1H-tetrazole derivatives. 4,085,111, Cl. 260-296.00H.

Officine Savio, S.p.A.: *See—*
Speranzin, Claudio, 4,084,766, Cl. 242-129.620.

Ogawa, Masaya; and Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Projection device for a photocopying machine. 4,084,895, Cl. 355-1.000.

Ogihara, Masuo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,084,403, Cl. 58-23.00D.

Ohlinger, Manfred; Wagner, Gerhard; Honecker, Gerhard; Stritzinger, Heinz; and Spaehn, Heinz, to BASF Aktiengesellschaft. Reducing corrosion in reactors used for the synthesis of chromium dioxide. 4,084,936, Cl. 21-2.70R.

Ohnishi, Kimimasa: *See—*
Tojo, Akio; and Ohnishi, Kimimasa, 4,084,623, Cl. 139-435.000.

Ohsako, Kyoichi; and Yamashita, Katusuke, to Laurel Bank Machine Co., Ltd. Memory device with error prevention of data during power failure. 4,085,311, Cl. 235-92.0FP.

Ohta, Wasaburo: *See—*
Ishida, Tsutomu; Nomura, Masaaki; and Ohta, Wasaburo, 4,084,899, Cl. 355-14.000.

Ohtake, Masaichi: *See—*
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.

Oikawa, Hiroshi: *See—*
Ariga, Nagao; Nanbu, Junji; and Oikawa, Hiroshi, 4,085,018, Cl. 204-159.150.

Oil States Rubber Company: *See—*
Landers, Don B.; and Brock, Robert K., 4,084,801, Cl. 267-140.000.

Oji-Yuka Synthetic Paper Sales Co., Ltd.: *See—*
Yamagata, Ichiki, 4,084,689, Cl. 206-280.000.

Okada, Hisao: *See—*
Mogi, Takao; Morita, Koji; and Okada, Hisao, 4,085,371, Cl. 325-464.000.
Mogi, Takao; and Okada, Hisao, 4,085,372, Cl. 325-464.000.

Okada, Ryuzo; and Okamoto, Yoshikazu, to Rank Xerox, Ltd. Positioning apparatus for magnetic brush developing device. 4,084,542, Cl. 118-658.000.

Okada, Senri, to Nippon Concrete Kogyo Kabushiki Kaisha. Split mould for making tapered concrete poles. 4,084,782, Cl. 249-135.000.

Okamoto, Arimichi: *See—*
Ishikawa, Tatsuo; Yamashita, Keiji; Okubo, Norio; Sakashita, Masahira; Okamoto, Arimichi; and Kusunose, Tetsuhiro, 4,085,174, Cl. 264-49.000.

Okamoto, Yoshikazu: *See—*
Okada, Ryuzo; and Okamoto, Yoshikazu, 4,084,542, Cl. 118-658.000.

Okubo, Kazutomo: *See—*
Niwata, Tatuji; Okubo, Kazutomo; Nakanishi, Fumio; and Yamada, Masanori, 4,085,422, Cl. 358-118.000.

Okubo, Norio: *See—*
Ishikawa, Tatsuo; Yamashita, Keiji; Okubo, Norio; Sakashita, Masahira; Okamoto, Arimichi; and Kusunose, Tetsuhiro, 4,085,174, Cl. 264-49.000.

Okuma Machinery Works, Ltd.: *See—*
Narushima, Hiroshi; and Hotta, Takayosi, 4,084,300, Cl. 29-26.00A.

Okumura, Koji, to Xerox Corporation. Electrical information storage system. 4,085,455, Cl. 365-112.000.

Okushi, Akira: *See—*
Kawakami, Takajiro; Mizuno, Minesilo; Okushi, Akira; and Yasuda, Michio, 4,085,237, Cl. 427-150.000.

Okuzawa, Tugio: *See—*
Kaneko, Tamaki; and Okuzawa, Tugio, 4,084,508, Cl. 101-142.000.

Olin Energy Systems, Ltd.: *See—*
Morris, Kenneth John; and Salovsky, Jan, 4,084,932, Cl. 425-405.00H.

Olson, Knute E., Jr. Jet launch toy. 4,084,820, Cl. 273-96.00R.

Olszewski, Jerzy A.; and Jachimowicz, Ludwig, to General Cable Corporation. D-shield telephone cables. 4,085,284, Cl. 174-36.000.

Olympus Optical Co., Ltd.: *See—*
Ito, Hiromi, 4,084,541, Cl. 118-421.000.

Ongaro Dynamics, Ltd.: *See—*
Ongaro, Theodore, 4,084,350, Cl. 51-106.00R.

Ongaro, Theodore, to Ongaro Dynamics, Ltd. Correction of rubber tires for forces generated by dynamic non-uniformities. 4,084,350, Cl. 51-106.00R.

Optarac Corporation: *See—*
Dunchock, Richard S., 4,084,700, Cl. 211-41.000.

Optel Corporation: *See—*
Witzke, Horst, 4,085,257, Cl. 429-111.000.

OPTI Patent- Forschungs- und Fabrikations-AG: *See—*
Frohlich, Alfons; and Hochlehnert, Franz, 4,084,297, Cl. 24-205.13C.

Oravitz, James L., Jr.: *See—*
Gorman, Harold R.; Dahlberg, John R.; and Oravitz, James L., Jr., 4,084,737, Cl. 225-2.000.

Osborne, Joseph Cyril: *See—*
Goodrich, Lewis Charles; Holt, Theron Robert; Osborne, Joseph Cyril; Pusey, Donald Kirk; and Roxlo, James William, 4,084,434, Cl. 73-160.000.

Oshida, Yoshitada: *See—*
Tsunoda, Yoshito; Maeda, Takeshi; and Oshida, Yoshitada, 4,085,423, Cl. 358-128.000.

Oshinsky, Frank W.; and Brown, Thomas R., Sr., to McConway & Torley Corporation. Lock for a railway vehicle coupler. 4,084,705, Cl. 213-127.000.

Osinskaya, Tamila Iosifovna: *See—*
Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Koltyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna, 4,084,484, Cl. 90-24.00C.

Otaki, Yukio: *See—*
Nakagawa, Kiyoshi; Otaki, Yukio; Mineo, Masatoshi; Aratani, Yoshio; Tatsuoka, Yoshio; and Kusakabe, Haruhiko, 4,084,622, Cl. 139-420.00R.

Otani, Kouji; Sawa, Toshio; Kuroda, Osamu; Nakajima, Fumito; and Iijima, Tokuji, deceased (by Iijima, Yoshie, administratrix), to Hitachi, Ltd. Waste flue gas desulfurizing method. 4,085,194, Cl. 423-242.000.

Otrhalek, Joseph V.; Gomes, Gilbert Stephen; and Elfers, Gunther Hans, to BASF Wyandotte Corporation. Method of recovering tall-oil soap from kraft black liquor. 4,085,000, Cl. 162-16.000.

Otsuka Pharmaceutical Factory, Inc.: *See—*
Aoki, Mitsuo; Watanabe, Kazuhiko; Murase, Shunichi; and Hiraoka, Isao, 4,085,207, Cl. 424-180.000.

Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, to Nippon Oil Company, Limited. Process for isomerization of lower polymers of butadiene. 4,085,263, Cl. 526-47.000.

Otsuki, Yutaka; Imai, Hirosuke; Kaiya, Atsushi; and Horii, Hideo, to Nippon Oil Company, Limited. Process for isomerization of lower polymers of butadiene. 4,085,265, Cl. 526-49.000.

Ottawa Roof Truss, Inc.: *See—*
Weaver, Austin S., 4,084,498, Cl. 100-210.000.

Otto Niederer Sons, Inc.: *See—*
Niederer, Floyd S., 4,084,698, Cl. 209-121.000.

Oude Alink, Bernardus A., to Petrolite Corporation. Hexahydropyrimidines. 4,085,105, Cl. 260-251.00A.

Outlaw, Homer G. Radial engine. 4,084,555, Cl. 123-58.0AA.

Ovation Instruments, Inc.: *See—*
Rickard, James H., 4,084,476, Cl. 84-293.000.

Owens-Illinois, Inc.: *See—*
Doherty, Thomas E., 4,084,490, Cl. 93-55.10R.
Fein, Michael E.; and Salisbury, Charles W., 4,085,385, Cl. 331-94.50D.
Pei, Yu Kun, 4,084,576, Cl. 126-270.000.

Ozaki, Toshio: *See*—
Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, 4,084,841, Cl. 280-745.000.
P. R. Mallory & Co. Inc.: *See*—
Dey, Arabinda N., 4,085,256, Cl. 429-48.000.
PACCAR Inc.: *See*—
Trexler, Ray W., Jr.; and Teodoro, Donald J., 4,084,276, Cl. 5-118.000.
Pace, Salvatore J., to Technicon Instruments Corporation. Methods for determination of enzyme reactions. 4,085,009, Cl. 204-1.00T.
Package Machinery Company: *See*—
Schoppee, Lawrence W., 4,084,509, Cl. 101-261.000.
Packard, Newton R.: *See*—
Pylant, John D.; Lozeau, Paul R.; and Packard, Newton R., 4,084,503, Cl. 101-96.000.
Padgett, Billy. Noise reduction device for citizen's band transceivers. 4,085,366, Cl. 325-22.000.
Paglia, Richard, to Polaroid Corporation. Spring force biasing means for electroacoustical transducer components. 4,085,297, Cl. 179-111.00R.
Palm, William A.; and Young, Duane A., to Control Data Corporation. Matrix selection amplifier circuit for low impedance heads in a magnetic disc memory device. 4,085,383, Cl. 330-295.000.
Paradyne Corporation: *See*—
Walsh, Dale M.; and Nordling, Karl I., 4,085,449, Cl. 364-900.000.
Paranjpe, Suresh C., to Mead Corporation, The. Method and apparatus for ink jet printing. 4,085,409, Cl. 346-75.000.
Park, Kyong P.; and Vellturo, Anthony F., to Ciba-Geigy Corporation. Process for the production of hydroxyalkylphenyl derivatives. 4,085,132, Cl. 560-75.000.
Parke, Davis & Company: *See*—
Tinney, Francis John; and Nicolaides, Ernest D., 4,085,096, Cl. 260-112.5LH.
Parker, Richard P. Container with built-in opening system. 4,084,723, Cl. 220-277.000.
Parkyn, Derek J., to U.S. Philips Corporation. High voltage A.C. to low voltage D.C. switching interface circuit. 4,085,342, Cl. 307-260.000.
Pasbrig, Max. Wrench. 4,084,456, Cl. 81-177.800.
Passingham, Roy John: *See*—
Telling, Ronald Charles; Passingham, Roy John; Kitchener, Brian Lewis; and Hopkinson, David George, 4,085,203, Cl. 424-89.000.
Patchornik, Avraham; Warshawsky, Abraham; Fridkin, Matityahu; and Kalir, Rami, to Yeda Research and Development Co., Ltd. Organic reagents and process of preparing same. 4,085,261, Cl. 526-19.000.
Patel, Anilkumar U.: *See*—
Rosynek, John J.; and Patel, Anilkumar U., 4,084,722, Cl. 220-270.000.
Patterson, Stephen D.: *See*—
Greenberg, Paul B.; and Patterson, Stephen D., 4,084,861, Cl. 308-26.000.
Paul, Roy A. Apparatus for collecting and handling recycleable paper. 4,084,495, Cl. 100-34.000.
Pavlecka, Vladimir H., to Turbomachines, Inc. Wind motor rotor having substantially constant pressure and relative velocity for airflow therethrough. 4,084,918, Cl. 415-1.000.
Pearlman, Martin B. Surface treatment. 4,085,131, Cl. 252-470.000.
Pechmeze, Jacques Pierre Edmond: *See*—
Leroy, Jean Marie Louis; and Pechmeze, Jacques Pierre Edmond, 4,085,099, Cl. 260-207.000.
Pegg, Charles E.: *See*—
Aasen, Torulf F.; Nisenson, Jules; and Pegg, Charles E., 4,084,901, Cl. 355-16.000.
Pei, Yu Kun, to Owens-Illinois, Inc. Bulb-type solar energy collector. 4,084,576, Cl. 126-270.000.
Pelly, Charles W., to Sears Manufacturing Company. Vehicle seat. 4,084,775, Cl. 297-453.000.
Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 5-(5-Halogenatedphenyl-2-furanyl)dihydro-2(3H)-furanones. 4,085,118, Cl. 260-343.600.
Peltier, Jean Paul: *See*—
Aigrain, Pierre; Broussaud, Georges; Peltier, Jean Paul; and Spitz, Erich, 4,085,426, Cl. 360-38.000.
Peltier, Raymond; and Meric, Jean-Paul. Illuminated display apparatus. 4,084,339, Cl. 40-560.000.
Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,084,288, Cl. 16-21.000.
Penfold, Charles S.: *See*—
McDevitt, Robert F., 4,084,441, Cl. 73-425.40R.
Pennwalt Corporation: *See*—
Shetty, Bola Vithal, 4,085,107, Cl. 260-256.40Q.
Pequegnat, Willis E., to TerEco Corporation. Aquatic biotal monitor. 4,084,543, Cl. 119-3.000.
Perlmutter, Frank. Glove form. 4,084,733, Cl. 223-78.000.
Perry, Elisabeth D., executrix: *See*—
Perry, Walter Merton, deceased, 4,084,721, Cl. 220-269.000.
Perry, Walter Merton, deceased (by Perry, Elisabeth D., executrix), to Continental Group, Inc., The. Container with attached closure. 4,084,721, Cl. 220-269.000.
Pertl, Jerry Hudson; and Kregness, Glen Roy, to Sperry Rand Corporation. Right justified mask transfer apparatus. 4,085,447, Cl. 364-900.000.
Peters, Clifford M., to W-K-M Wellhead Systems, Inc. Combination high-low pilot valve. 4,084,613, Cl. 137-596.180.
Petersik, Adolph R., to CMI Corporation. Slip form having reinforcement accommodating means. 4,084,928, Cl. 425-64.000.
Peterson, Carl R., to Rapidex, Inc. Drag bit excavation. 4,084,854, Cl. 299-57.000.
Peterson, Donald John; and Robbins, Medford Dwight, to Procter & Gamble Company, The. Preparation of chrysanthemic acid compounds. 4,085,273, Cl. 560-124.000.
Peterson Machine Tool, Inc.: *See*—
Moses, Robert W., 4,084,357, Cl. 51-419.000.
Petro Canada Exploration Inc.: *See*—
Todd, John C., 4,084,637, Cl. 166-245.000.
Todd, John C., 4,084,639, Cl. 166-248.000.
Petrolite Corporation: *See*—
Alink, Bernardus A. Oude, 4,085,104, Cl. 260-251.00R.
Lissant, Kenneth J., 4,084,940, Cl. 44-51.000.
Oude Alink, Bernardus A., 4,085,105, Cl. 260-251.00A.
Quinlan, Patrick M., 4,084,950, Cl. 71-67.000.
Redmore, Derek; and Welge, Frederick T., 4,085,134, Cl. 260-502.500.
Petrometer Corporation: *See*—
Weik, Edward; and Thomson, Roger, 4,084,435, Cl. 73-299.000.
Pettersson, Bengt Edvard, to Sunds Aktiebolag. Bleaching tower for gas phase bleaching. 4,085,002, Cl. 162-238.000.
Pfizer Inc.: *See*—
Bindra, Jaajit S., 4,085,213, Cl. 424-251.000.
Myers, Robert F., 4,085,119, Cl. 260-343.000.
Phelps Dodge Industries, Inc.: *See*—
Biskeborn, Merle C., 4,084,997, Cl. 156-356.000.
Philip, Charles R. Fishing device. 4,084,342, Cl. 43-19.200.
Phillips Petroleum Company: *See*—
Bowers, John R., 4,084,464, Cl. 83-94.000.
Cheng, Paul J., 4,085,197, Cl. 423-450.000.
Cobb, Raymond L., 4,085,130, Cl. 260-465.200.
Dixon, Roland E.; and Hann, P. Douglas, 4,085,158, Cl. 260-680.00E.
Hawkins, Harold M., deceased, 4,085,007, Cl. 195-109.000.
Kinney, Alfred W., 4,084,488, Cl. 93-36.00B.
Phillips Screw Company: *See*—
Simmons, Frederick A., 4,084,478, Cl. 85-45.000.
Phoenix Gummiwerke AG: *See*—
Eichholz, Werner; and Krebs, Gerd, 4,084,998, Cl. 156-403.000.
Piazza, Matthew R., to Maso-Therm Corporation. Anchored composite building module. 4,084,362, Cl. 52-309.200.
Pichler, Engelbert: *See*—
Kratel, Gunter; Bauer, Johann; Pichler, Engelbert; and Kalmuk, Hans-Peter, 4,085,087, Cl. 260-42.490.
Pierce, James K., to Dow Chemical Company, The. Hexamethylenetetramine phenoxylalkyl salts. 4,085,281, Cl. 544-185.000.
Pilipenki, Vitaly Alexandrovich: *See*—
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.
Pinard, Jacques Andre; and Juncar, Patrick Pierre Paul, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for determining the wave number of optical spectrum radiation. 4,084,907, Cl. 356-106.00S.
Pine, Lloyd A.: *See*—
Cull, Neville L.; Pine, Lloyd A.; and Maness, Dale D., 4,085,195, Cl. 423-244.000.
Pircher, Georges, to Thomson-CSF. High-precision mask photorepeater. 4,084,903, Cl. 355-53.000.
Piro, Mario, to Nuova San Giorgio S.p.A. Method and a device for winding up a yarn reserve. 4,084,759, Cl. 242-18.0PW.
Pitney-Bowes, Inc.: *See*—
Aasen, Torulf F.; Nisenson, Jules; and Pegg, Charles E., 4,084,901, Cl. 355-16.000.
Plant, Thomas K.: *See*—
Asawa, Charles K.; and Plant, Thomas K., 4,085,387, Cl. 331-94.50M.
Plasschaert, Paulus E.: *See*—
Fairey, Brian M.; and Plasschaert, Paulus E., 4,084,682, Cl. 197-168.000.
Plaut, Jonathan: *See*—
Buff, Ernest Dorchester; and Plaut, Jonathan, 4,084,840, Cl. 280-744.000.
Plessey Handel und Investments A.G.: *See*—
Godber, Geoffrey Allan, 4,084,987, Cl. 148-1.500.
Plichta, Zdenek: *See*—
Bleha, Miroslav; Votavova, Eva; and Plichta, Zdenek, 4,085,005, Cl. 195-68.000.
Plumlee, Karl W., to Exxon Research & Engineering Co. Hydrogen donor solvent coal liquefaction process. 4,085,033, Cl. 208-10.000.
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PNC Corporation: *See*—
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Pohl, Hubert: *See*—
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Poirier, Robert H.; and Poziomek, Edward J., to United States of

America, Army. 2-Formyl-3-alkyl-benzothiazolium halide oxime. 4,085,112, Cl. 260-304.00C.
Poirier, Victor L.; and Keiser, John T., to United States of America, Health, Education and Welfare. Artificial implant with fiber-flocked blood-contacting surface. 4,084,266, Cl. 3-1.000.
Polaroid Corporation: *See*—
Burgarella, John P.; Turner, George, Jr.; and Stephansky, Robert L., 4,085,414, Cl. 354-145.000.
Johnson, Bruce K., 4,085,253, Cl. 429-1.000.
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Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Hydrocarbon isomerization catalyst. 4,085,067, Cl. 252-442.000.
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Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Koltyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna, 4,084,484, Cl. 90-24.00C.
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Portec, Inc.: *See*—
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Portescap: *See*—
Heyraud, Marc; and Martin, Andre, 4,084,502, Cl. 101-93.290.
Post, Herman D. Self-moistening cleaning device. 4,084,286, Cl. 15-104.930.
Post Office: *See*—
Jones, Ralph Archibald; and Drew, Allan Mathieson, 4,085,290, Cl. 179-1.0CN.
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Poush, Kenneth A.; and Reynolds, James E., to Kerr-McGee Chemical Corporation. Hybrid bipolar electrode. 4,085,027, Cl. 204-268.000.
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Wall, Bill R., 4,085,399, Cl. 338-200.000.
Powers Regulator Company: *See*—
Tyler, Tommy N., 4,084,769, Cl. 243-3.000.
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PPG Industries, Inc.: *See*—
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Chang, Wen-Hsuan; and Ammons, Vernon G., 4,085,092, Cl. 260-77.5AN.
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Gorman, Harold R.; Dahlberg, John R.; and Oravitz, James L., Jr., 4,084,737, Cl. 225-2.000.
Preston, John; and Reeve, Austin John, to Imperial Chemical Industries Limited. 6-Substituted-4-hydroxycinnolin-3-yl-carboxylic acids and esters thereof. 4,085,103, Cl. 260-250.00C.
Prior, William L.; and Lindstrom, Richard S., to Arthur D. Little, Inc. Filled inorganic resin cements and compositions and process for forming them. 4,084,982, Cl. 106-105.000.
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Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.
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Prosek, John R.; and Tamburino, James C., to International Harvester Company. Roll-over protection structure for dump truck. 4,084,852, Cl. 298-22.00C.
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Pyle, Lawrence F.; and Brady, John F., to Felt Products Mfg. Co. Method and assembly for sealing gaps between adjacent roadway slabs. 4,084,912, Cl. 404-74.000.
Quan, Wing C.; Edison, David M.; Hummert, George T.; and Sackin, Milton, to Westinghouse Electric Corporation. Elevator system. 4,084,661, Cl. 187-29.00R.
Queener, Carl Allan, to International Business Machines Corporation. Half-lens/mirror copier providing original-to-copy image reduction. 4,084,897, Cl. 355-8.000.
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Rakitin, Vladimir Jurievich; Fedorov, Igor Konstantinovich; Grigorian, Alfred Nikitovich; Lalov, Vitaly Viktorovich; and Prokofieva, Nina Vasilievna. Apparatus for continuous disintegration of cells of microorganisms. 4,084,757, Cl. 241-301.000.
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Tanaka, Masaaki, 4,084,538, Cl. 118-4.000.
Terajima, Yasuhiko; and Matsumoto, Osamu, 4,084,807, Cl. 271-119.000.
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Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.
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Bloom, Allen; Ross, Daniel Louis; Bartolini, Robert Alfred; and Hung, Ling Kong, 4,084,970, Cl. 96-88.000.
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Andrus, Ronald L.; and Reade, Richard F., 4,084,973, Cl. 106-39.700.
Reckson, Harry. Combination spline groove. 4,084,360, Cl. 52-63.000.
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Reed, Jack K. Carbide tipped insertable saw tooth. 4,084,470, Cl. 83-841.000.
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Reier, Richard; and Kuelzer, Peter, to Siemens Aktiengesellschaft. Printer needle guide means for mosaic printers. 4,084,678, Cl. 197-1.00R.
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Reinbold, George W.; and Reddy, Malireddy S., to Leprino Cheese Co. Preparation of pizza cheese. 4,085,228, Cl. 426-36.000.
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Reitemeyer, Paul; and Reifenhauser, Hans, to Reifenhauser KG. Apparatus for the sealing of the interior of synthetic-resin tubes during extrusion. 4,084,933, Cl. 425-467.000.
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Reynolds, James K., to Du Pont de Nemours, E. I., and Company. Use of alkyl(aminocarbonyl)phosphonate salts in rice culture for the control of problem herbaceous plant growth. 4,084,952, Cl. 71-86.000.
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Miroslav; and Mison, Petr. Composition for treatment of infectious diseases in animals. 4,085,206, Cl. 424-131.000.
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Schneeberger, Martin; and Wittmann, Dieter, to Linde AG. Heat exchanger. 4,084,546, Cl. 122-32.000.

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Daumiller, Guenther; Merkel, Karl; Neumayr, Franz; and Schneider, Kurt, 4,085,269, Cl. 544-221.000.

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Van Scoy, Robert W., 4,085,192, Cl. 423-226.000.
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Shinohara, Katsuhiko; Kuramochi, Yoshinori; Suehiro, Tetsuo; and Matsubara, Ichiro, to Hitachi, Ltd. Electronic system for process instrumentation and control. 4,085,334, Cl. 307-11.000.
Shinozaki, Nobuo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,084,403, Cl. 58-23.00D.
Shinsei Kogyo Co., Ltd.: *See*—
Asano, Kiyoji, 4,084,344, Cl. 46-28.000.
Shionogi & Co., Ltd.: *See*—
Adachi, Ikuo; Ueda, Motohiko; and Kimoto, Sadatoshi, 4,085,114, Cl. 260-307.0DA.
Takamizawa, Akira; and Iwata, Tsuyoshi, 4,085,128, Cl. 260-456.00A.
Shipley Company Inc.: *See*—
Gulla, Michael, 4,085,066, Cl. 252-434.000.
Shklyanov, Leonid Pavlovich; Baranov, Vladimir Nikitich; Koltyrev, Dmitry Nikiforovich; Lifshits, Viktor Senderovich; Polyansky, Ivan Ivanovich; and Osinskaya, Tamila Iosifovna. Device for removing internal circular flash. 4,084,484, Cl. 90-24.00C.
Shkrabov, Boris Semenovich: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.
Shorrock Developments Limited: *See*—
Hasler, William Sandford, 4,085,304, Cl. 200-61.45R.
Shubert, Nick J. Pyramidal solar heater. 4,084,573, Cl. 126-270.000.
Shutov, Gennady Nikolaevich: *See*—
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.
Sick, Erwin, to Erwin Sick Gesellschaft mit beschrankter Haftung Optik-Elektronik. Optical apparatus. 4,085,322, Cl. 250-227.000.
Siclari, Francesco; and Rossi, Pietro Paolo, to SNIA Viscosa Societa' Nazionale Industria Application Viscosa S.p.A. Method for producing aldehyde acids by selective ozonization of cyclo-olefins. 4,085,127, Cl. 260-413.000.
Siegert, Klaus: *See*—
Zilges, Franz Josef; and Siegert, Klaus, 4,084,422, Cl. 72-253.00R.
Siemens Aktiengesellschaft: *See*—
Chakrabarty, Naresh; and Weitze, Artur, 4,084,314, Cl. 29-626.000.
Goser, Karl; and Mueller, Ruediger, 4,085,339, Cl. 307-213.000.
Grave, Burghard; Gutbier, Heinrich; and Deinzer, Michael, 4,085,255, Cl. 429-26.000.
Heinzl, Joachim; and Rosenstock, Guenter, 4,084,681, Cl. 197-82.000.
Hjort, Bo, 4,084,583, Cl. 128-2.06R.
Juergens, Wilfried; Roschy, Manfred; and Schauer, Alois, 4,085,011, Cl. 204-37.00R.
Reier, Richard; and Kuelzer, Peter, 4,084,678, Cl. 197-1.00R.
Siemon-Dynamic Mfg. Company, The: *See*—
Knickerbocker, Robert H., 4,084,877, Cl. 339-97.00P.
Sigler, Robert D., to KMS Fusion, Inc. All-reflective optical target illumination system with high numerical aperture. 4,084,887, Cl. 350-294.000.
Silverman, Richard H. Price marking system for automated check-out of merchandize. 4,084,742, Cl. 235-419.000.
Simington, Jack F., to Simington Products Co. Oscillating saw chain sharpener. 4,084,452, Cl. 76-42.000.
Simington Products Co.: *See*—
Simington, Jack F., 4,084,452, Cl. 76-42.000.
Simmons, Frederick A., to Phillips Screw Company. Screw heads. 4,084,478, Cl. 85-45.000.
Simon, Helmut: *See*—
Atallah, Khaled; Berthold, Fritz; Kolbe, Wolfgang; Rauschenbach, Peter; and Simon, Helmut, 4,085,325, Cl. 250-328.000.
Simonson, Robert Clayton: *See*—
Stroud, Ruben Jasper; and Simonson, Robert Clayton, 4,084,925, Cl. 417-554.000.
Simpson, Adam, to Burroughs Corporation. Sheet handling device particularly useful as ledger feeder and stacker for accounting machines. 4,084,805, Cl. 271-4.000.
Simpson, David Preston; and Lawton, James, to Electricity Council,

The. Method and apparatus for increasing contact area in a multi-phase system. 4,085,170, Cl. 261-1.000.
Simpson, John I.: *See*—
Hogan, Elmer R.; Hollis, Charles Edward; and Simpson, John I., 4,084,293, Cl. 17-52.000.
Singer Company, The: *See*—
Galuschak, George; and Malkiel, Saul Leon, 4,085,375, Cl. 328-160.000.
Singleton, Alan H.; Homberg, Otto A.; and Sheldrake, Charles W., to Bethlehem Steel Corporation. Method for removing hydrogen sulfide from sulfur-bearing industrial gases with claus-type reactors. 4,085,199, Cl. 423-574.00R.
Sinnamon, Howard I.: *See*—
Komanowsky, Michael; and Sinnamon, Howard I., 4,085,044, Cl. 210-45.000.
Sipusic, Frank; and Sheridan, Arthur L., to Union Carbide Corporation. Apparatus for severing thin-walled tubing on a mandrel. 4,084,466, Cl. 83-193.000.
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Insecticidal N-(substituted phenyl)-N'-benzoyl ureas. 4,085,226, Cl. 424-322.000.
Sisco, William Braxton: *See*—
Williams, John Chamberlin; and Sisco, William Braxton, 4,085,367, Cl. 325-67.000.
Siuta, Gerald Joseph: *See*—
Weiss, Martin Joseph; and Siuta, Gerald Joseph, 4,085,272, Cl. 560-121.000.
Six, Jean-Claude Gerard: *See*—
Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, 4,085,310, Cl. 219-502.000.
Skeirik, Lewis. System for mixing and dispensing dental amalgam. 4,084,320, Cl. 32-60.000.
SKF Industrial Trading & Development Company B.V.: *See*—
van Nederveen, Hans Bertil, 4,084,649, Cl. 175-366.000.
SKF Kugellagerfabriken GmbH: *See*—
Kohler, Gisbert; Munkel, Hanns-Wilfried; Pohl, Hubert; Sommer, Walter; and Wendel, Gunther, 4,084,860, Cl. 308-15.000.
Skinner, Frank R., II, to Whirlpool Corporation. Conveyor transfer method and apparatus. 4,084,684, Cl. 198-467.000.
Skinner, Kenneth Charles, to Helipebs Limited. Forming roll for rolling cylindrical bodies from cylindrical rod stock, and a method of making the same. 4,084,303, Cl. 29-148.40D.
Sliva, Philip O., to Xerox Corporation. Multi-phase photoactivated switch. 4,085,321, Cl. 250-211.00R.
Smith-Berger Manufacturing Corporation: *See*—
Hogan, Elmer R.; Hollis, Charles Edward; and Simpson, John I., 4,084,293, Cl. 17-52.000.
Smith, Eugene David. Fluid-powered rotary brush. 4,084,281, Cl. 15-29.000.
Smith, James D. B., to Westinghouse Electric Corporation. Resin rich epoxide-mica flexible high voltage insulation. 4,085,250, Cl. 428-418.000.
Smith, Lee H.; and Alexandrowicz, Norman J., to Dynapar Corporation. Potentiometer having improved operating means. 4,084,675, Cl. 192-95.000.
Smith, Leslie Harold, to Imperial Chemical Industries Limited. Ethanolamine derivatives. 4,085,221, Cl. 424-275.000.
Smith, Oliver Dale; and Goldberg, Gerald M., to Bunker Ramo Corporation. Foam type coating remover. 4,085,059, Cl. 252-118.000.
Smith, Robert L.: *See*—
Cragoe, Edward J., Jr.; Bicking, John B.; and Smith, Robert L., 4,085,125, Cl. 260-402.000.
Smith, Ronald A., to Fairchild Camera and Instrument Corporation. Hand-held controller device. 4,085,301, Cl. 200-4.000.
Smith, William Edward, to General Electric Company. Process for the ortho alkylation of phenols in the presence of a copper-zinc-aluminum mixed oxide catalyst. 4,085,150, Cl. 260-621.00R.
Smitherman, Ray C., to RTR Incorporated. Fuel oil level measuring apparatus. 4,084,436, Cl. 73-313.000.
SmithKline Corporation: *See*—
Kingsbury, William D., 4,085,100, Cl. 260-239.00A.
Snell, Thomas Bartlett. Survey apparatus. 4,084,359, Cl. 52-40.000.
SNIA Viscosa Societa' Nazionale Industria Application Viscosa S.p.A.: *See*—
Siclari, Francesco; and Rossi, Pietro Paolo, 4,085,127, Cl. 260-413.000.
Snow, Wallace Leon: *See*—
Schmidt, John Michael; and Snow, Wallace Leon, 4,085,406, Cl. 343-895.000.
Societa' Farmaceutici Italia S.p.A.: *See*—
Foglio, Maurizio; Scarponi, Ugo; and Arcamone, Federico, 4,085,113, Cl. 260-306.70C.
Societe Anonyme Francaise du Ferodo: *See*—
de Gennes, Gerard, 4,084,674, Cl. 192-89.00B.
Societe Anonyme Potain Poclain Materiel (P.P.M.): *See*—
Lambert, Bernard Leon, 4,084,777, Cl. 248-287.000.
Societe d'Etudes de Machines Thermiques: *See*—
Michon, Pierre, 4,084,410, Cl. 64-12.000.
Societe Diete: Stabilimento Industriale Construzione Macchinario Attrezzature: *See*—
Bossi, Oscar G., 4,084,481, Cl. 90-1.60R.
Societe d'Optique, Precision Electronique et Mecanique - SOPELEM: *See*—
Coussot, Pierre, 4,084,885, Cl. 350-175.0ML.
Societe Francaise des Produits pour Catalyse: *See*—
Juguin, Bernard; Cosyns, Jean; LePage, Jean-Francois; and Miquel, Jean, 4,085,157, Cl. 260-673.000.
Societe Generale de Constructions Electriques et Mecaniques Alsthom S.A.: *See*—
Lecoffre, Yves, 4,084,432, Cl. 73-148.000.
Societe Hure S A: *See*—
Derrien, Robert F., 4,084,482, Cl. 90-11.00R.
Societe Ramo S.A.: *See*—
Champeau, Marcel; and Tabutin, Andre, 4,084,461, Cl. 82-21.00B.
Soeder, Carl Johannes: *See*—
Stengel, Eberhard; and Soeder, Carl Johannes, 4,084,346, Cl. 47-1.400.
Soma, Munemasa: *See*—
Goto, Tadahiro; and Soma, Munemasa, 4,085,295, Cl. 179-84.0VF.
Sommer, Walter: *See*—
Kohler, Gisbert; Munkel, Hanns-Wilfried; Pohl, Hubert; Sommer, Walter; and Wendel, Gunther, 4,084,860, Cl. 308-15.000.
Song, Dae Suk; Duffy, Richard Joseph; Witschonke, Charles Richard; Schiller, Arthur Maurice; and Higgins, Mark Allan, to American Cyanamid Company. Low molecular weight hydrolyzed polyacrylamide used as a scale inhibitor in water systems. 4,085,045, Cl. 210-58.000.
Sony Corporation: *See*—
Aoki, Teruaki; Matsushita, Takeshi; Mifune, Tadayoshi; and Hayashi, Hisao, 4,084,986, Cl. 148-1.500.
Chikatsu, Masahiro, 4,085,431, Cl. 361-56.000.
Mogi, Takao; Morita, Koji; and Okada, Hisao, 4,085,371, Cl. 325-464.000.
Mogi, Takao; and Okada, Hisao, 4,085,372, Cl. 325-464.000.
Spaehn, Heinz: *See*—
Ohlinger, Manfred; Wagner, Gerhard; Honecker, Gerhard; Stritzinger, Heinz; and Spaehn, Heinz, 4,084,936, Cl. 21-2.70R.
Sparko, William E.: *See*—
Baker, Donald B.; and Sparko, William E., 4,085,171, Cl. 261-36.00R.
Spencer, Clark V.; and Rondeau, Benjamin G. Frame saver for logging trucks. 4,084,835, Cl. 280-148.000.
Speranzin, Claudio, to Officine Savio, S.p.A. Device to disrupt the balloon of yarn. 4,084,766, Cl. 242-129.620.
Sperry Rand Corporation: *See*—
Godel, Siegfried; Pudims, Albert Adam; and Wergzyn, Richard, 4,085,309, Cl. 219-364.000.
Lodi, Robert J., 4,085,460, Cl. 365-230.000.
Pertl, Jerry Hudson; and Kregness, Glen Roy, 4,085,447, Cl. 364-900.000.
Spisak, Edward G. Method of forming rings. 4,084,526, Cl. 113-116.00E.
Spitz, Erich: *See*—
Aigrain, Pierre; Broussaud, Georges; Peltier, Jean Paul; and Spitz, Erich, 4,085,426, Cl. 360-38.000.
Spotts, Glenn R.: *See*—
Spotts, Willard; Arrandale, Thomas P.; and Spotts, Glenn R., 4,084,491, Cl. 98-121.00A.
Spotts, Willard; Arrandale, Thomas P.; and Spotts, Glenn R., to McGraw-Edison Company. Oscillated louver assembly for breeze box fan. 4,084,491, Cl. 98-121.00A.
Sprague Electric Company: *See*—
Genesi, Robert Charles, 4,085,411, Cl. 354-51.000.
Squassoni, Gino F.: *See*—
Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 4,084,896, Cl. 355-3.00P.
Stack, Michael John: *See*—
Grosch, Steven Wayne; and Stack, Michael John, 4,084,886, Cl. 350-281.000.
Stafford, Floyd: *See*—
Hrdlicka, Theodore Frederick; and Stafford, Floyd, 4,085,437, Cl. 362-109.000.
Stahl, Otto; and Hins, Johannes, to Georg Menshen & Co. KG. Child-proof closure device for containers. 4,084,728, Cl. 222-153.000.
Stahlecker, Fritz; and Stahlecker, Hans. Mobile servicing arrangement for open-end spinning machines. 4,084,398, Cl. 57-34.00R.
Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Hans, 4,084,398, Cl. 57-34.00R.
Stamicarbon, B.V.: *See*—
Den Otter, Marinus J. A. M.; Van Geenen, Albert A.; and Te Nijenhuis, Anne, 4,085,283, Cl. 544-214.000.
Stamires, Dennis: *See*—
Alafandi, Hamid; and Stamires, Dennis, 4,085,069, Cl. 252-455.00Z.
Standard Car Truck Company: *See*—
Bullock, Robert L., 4,084,513, Cl. 105-197.0DB.
Bullock, Robert L., 4,084,514, Cl. 105-197.0DB.
Standard Oil Company, The: *See*—
Milberger, Ernest C.; Bremer, Noel J.; and Wong, Eunice K. T., 4,085,121, Cl. 260-346.750.
Standard Oil Company (Indiana): *See*—
Caspari, Gunter, 4,085,053, Cl. 252-32.70E.
Standard Oil Company (Ohio), The: *See*—
White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., 4,085,065, Cl. 252-437.000.
Standing, Arthur Frederick, to Communications Satellite Corporation. Symmetrical stripline package. 4,085,390, Cl. 333-33.000.
Stansbury, Thomas A. Safety control system for hydraulic jet turbines. 4,084,536, Cl. 115-16.000.
Staron, Thadee Joseph, to Institut National de la Recherche

Agronomique. Process for the treatment of cakes and seeds of vegetable origin. 4,085,229, Cl. 426-46.000.
Stauffer, Harry C.: *See*—
Murphy, Harry C., Jr.; and Stauffer, Harry C., 4,085,036, Cl. 208-212.000.
Stedman, Robert N., to Caterpillar Tractor Co. Lift truck with means to pivot mast and the fork carriage thereon. 4,084,715, Cl. 214-660.000.
Stefani, Giancarlo; and Fontana, Pietro, to Lonza, Ltd. Production of maleic anhydride using a mixed-oxide oxidation catalyst containing vanadium and pentavalent phosphorus. 4,085,122, Cl. 260-346.750.
Stein, Helmut: *See*—
Zehender, Ernst; Blaich, Bernhard; Stein, Helmut; and Kerner, Karl, 4,084,248, Cl. 428-336.000.
Stein Industries, Inc.: *See*—
Hossalla, George J.; and Stein, Norman R., 4,084,703, Cl. 211-153.000.
Stein, Norman R.: *See*—
Hossalla, George J.; and Stein, Norman R., 4,084,703, Cl. 211-153.000.
Steinhards, Arnolds, deceased: *See*—
Kornis, Gabriel; Nidy, Eldon G.; Vostral, Henry J.; and Steinhards, Arnolds, deceased, 4,084,955, Cl. 71-92.000.
Stendel, Wilhelm: *See*—
Sirrenberg, Wilhelm; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,085,226, Cl. 424-322.000.
Stengel, Eberhard; and Soeder, Carl Johannes, to Gesellschaft fur Strahlen- und Umweltforschung mbH. Method and arrangement for optimally supplying autotrophic organisms with CO_2 nutrient. 4,084,346, Cl. 47-1.400.
Stephansky, Robert L.: *See*—
Burgarella, John P.; Turner, George, Jr.; and Stephansky, Robert L., 4,085,414, Cl. 354-145.000.
Sterling Drug Inc.: *See*—
Diana, Guy D.; and Cutler, Royal A., 4,085,144, Cl. 260-584.00R.
Sandermann, Wilhelm; Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,085,220, Cl. 424-274.000.
Stevens, Carlile R. Traffic control system. 4,085,434, Cl. 361-413.000.
Stevenson, Dennis Clifford: *See*—
Willis, David John; Stevenson, Dennis Clifford; and Bettle, William, 4,084,274, Cl. 5-61.000.
Stewart, William H., Jr.: *See*—
Klein, Norman E.; and Stewart, William H., Jr., 4,084,615, Cl. 137-624.110.
Stillman, Nathan, to Champion International Corporation. Balanced orientated flexible packaging composite. 4,085,244, Cl. 428-192.000.
Stilts, Kenneth Morris. Apparatus for insulating purlins. 4,084,368, Cl. 52-728.000.
Stilwell, James H.: *See*—
Ryan, Carl R.; and Stilwell, James H., 4,085,378, Cl. 329-124.000.
Stoelting Brothers Company: *See*—
Anhalt, Alfred E., 4,084,407, Cl. 62-342.000.
Stoffey, Donald G. Method for rigid enclosures and molded items. 4,085,180, Cl. 264-128.000.
Stoll, Max: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,085,109, Cl. 260-294.80E.
Stone-Platt Crawley Limited: *See*—
Evans, Robert, 4,085,362, Cl. 324-83.00D.
Stonitsch, Lawrence; and Stonitsch, Richard W. Conduit system with expansion coupling. 4,084,842, Cl. 285-47.000.
Stonitsch, Richard W.: *See*—
Stonitsch, Lawrence; and Stonitsch, Richard W., 4,084,842, Cl. 285-47.000.
Stora Kopparbergs Bergslags Aktiebolag: *See*—
Collin, Per Harald; and Widell, Bjorn, 4,084,958, Cl. 75-36.000.
Stratbucker, Robert A.; and Hagood, John S., to Health Technology Laboratories, Inc. Data plotter. 4,085,407, Cl. 346-33.0ME.
Strindehag, Ove Magnus, to AB Svenska Flaktfabriken. Rotor for rotary heat exchangers. 4,084,633, Cl. 165-8.000.
Stritzinger, Heinz: *See*—
Ohlinger, Manfred; Wagner, Gerhard; Honecker, Gerhard; Stritzinger, Heinz; and Spaehn, Heinz, 4,084,936, Cl. 21-2.70R.
Stroud, Ruben Jasper; and Simonson, Robert Clayton. Oil well pump with self-contained lubrication. 4,084,925, Cl. 417-554.000.
Stukenbrock, Heiner. Light pipe image display. 4,085,420, Cl. 358-56.000.
Stumpp, Bernard, to Zahnradfabrik Friedrichshafen AG. Turning tool, especially for copying turning. 4,084,917, Cl. 407-114.000.
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, to International Nickel Company, Inc., The. Reduction leaching of raw sea nodules with sulfides. 4,085,188, Cl. 423-32.000.
Subrick, Joseph: *See*—
Miles, Roscoe C.; Subrick, Joseph; and Talman, Woods G., 4,084,855, Cl. 299-64.000.
Suehiro, Tetsuo: *See*—
Shinohara, Katsuhiko; Kuramochi, Yoshinori; Suehiro, Tetsuo; and Matsubara, Ichiro, 4,085,334, Cl. 307-11.000.
Sugawara, Shin' Ichi: *See*—
Taniguchi, Seiho; Kawasaki, Yoichi; and Sugawara, Shin' Ichi, 4,085,249, Cl. 428-383.000.
Sugie, Akio: *See*—
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.
Sugihara, Kunihiko: *See*—
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; Sugihara, Kunihiko; and Takagi, Yasuo, 4,084,372, Cl. 60-278.000.
Sugimoto, Eiji: *See*—
Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, 4,084,841, Cl. 280-745.000.
Sugimura, Kazuo; and Sugimura, Nobuyuki. Accumulator consisting of welded vesael and lid. 4,084,621, Cl. 138-30.000.
Sugimura, Nobuyuki: *See*—
Sugimura, Kazuo; and Sugimura, Nobuyuki, 4,084,621, Cl. 138-30.000.
Sugiura, Hiroshi: *See*—
Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, 4,084,841, Cl. 280-745.000.
Suh, Kyung W.; and Killingbeck, Graydon Wayne, to Dow Chemical Company, The. Styrene polymer foam and the preparation thereof. 4,085,073, Cl. 260-2.50E.
Sullivan, Daryl Dean: *See*—
Odle, Herbert Arnold; Ruehl, Donald Edward; Shadwick, Jan; Sullivan, Daryl Dean; and Welty, Dale Eugene, 4,085,318, Cl. 362-217.000.
Sullivan, Neal, to KFC Corporation. System for providing like cooking medium volume in successive cooking cycles. 4,084,492, Cl. 99-330.000.
Sullivan, Paul A.: *See*—
McCoy, John H.; and Sullivan, Paul A., 4,085,329, Cl. 250-492.00A.
Sullivan, Paul E.: *See*—
Herbert, John T.; Sullivan, Paul E.; and Vitt, Stanley P., Jr., 4,084,785, Cl. 251-172.000.
Sumida, Yutaka: *See*—
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Sumitomo Chemical Company, Limited: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.
Nakai, Setsuo; Kita, Shinichiro; Hiki, Fumihiko; and Shimizu, Masayuki, 4,085,266, Cl. 526-65.000.
Sumiyoshi, Masaharu: *See*—
Noguchi, Masaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,084,551, Cl. 123-32.0SP.
Sunagawa, Makoto: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.
Sunds Aktiebolag: *See*—
Pettersson, Bengt Edvard, 4,085,002, Cl. 162-238.000.
Sunshine Mining Company: *See*—
Caldon, Frank, 4,084,961, Cl. 75-101.00R.
Suslin, Vladimir Isaakovich: *See*—
Lekarev, Zinovy Abramovich; Razdymakha, Pavel Semenovich; Davydov, Vladimir Nikolaevich; Shaforostov, Vladillen Antonovich; Kolosov, Leonid Pavlovich; Suslin, Vladimir Isaakovich; Makeev, Boris Anatolievich; Dubovik, Alexandr Ivanovich; Kolesnichenko, Anatoly Alexeevich; Etnaer, Alexandr Ivanovich; and Pilipenki, Vitaly Alexandrovich, 4,085,025, Cl. 204-224.00M.
Suwa, Masateru; and Komuro, Katsuhiro, to Hitachi, Ltd. Composite collector. 4,084,669, Cl. 191-45.00R.
Suzuki, Isamu: *See*—
Hashimoto, Masanao; Saitou, Tadashi; Kobayashi, Tatsuo; and Suzuki, Isamu, 4,084,373, Cl. 60-293.000.
Suzuki Motor Company Limited: *See*—
Ishimori, Shigeru; and Honda, Shinichi, 4,085,010, Cl. 204-16.000.
Suzuki, Takanori: *See*—
Sato, Kazunobu; Suzuki, Takanori; Kobayashi, Tadataka; and Miyazawa, Takeshi, 4,084,568, Cl. 123-182.000.
Suzuki, Yoshikatsu: *See*—
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.
Svenska Rotor Maskiner Aktiebolag: *See*—
Schibbye, Hjalmar; and Holmstrom, Tord, 4,084,405, Cl. 62-197.000.
Svrjcek, Benjamin W., Jr., to United States of America, Navy. Electrolytic timing element. 4,084,511, Cl. 102-70.2GA.
Swanco: *See*—
Booth, Morris A., 4,084,525, Cl. 113-1.00K.
Swank, Robert K.; and Yang, Kei-Hsiung, to General Electric Company. Direct charge readout electron radiography apparatus with improved signal-to-noise ratio. 4,085,327, Cl. 250-370.000.
Swiss Aluminium Limited: *See*—
Anthony, William H.; Brock, Andrew J.; and Gullotti, Damian V., 4,084,963, Cl. 75-138.000.
Systron-Donner Corporation: *See*—
Cook, Kenneth C., 4,084,602, Cl. 137-68.00A.
Tabutin, Andre: *See*—
Champeau, Marcel; and Tabutin, Andre, 4,084,461, Cl. 82-21.00B.
Tagaki, Shinji: *See*—
Kitashima, Riichi; Matsumoto, Masakazu; and Tagaki, Shinji, 4,084,473, Cl. 84-1.140.
Tagami, Eijiro: *See*—
Ishibashi, Yoshiyuki; Tagami, Eijiro; Higaki, Taiji; and Matsushita, Takao, 4,085,236, Cl. 427-121.000.

Taisho Pharmaceutical Co., Ltd.: *See*—
Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; Sawada, Jiro; and Tanaka, Ichiro, 4,085,135, Cl. 260-520.00C.
Takagi, Hiroyoshi: *See*—
Sano, Shiro; Hayashi, Hiroshi; and Takagi, Hiroyoshi, 4,084,979, Cl. 106-58.000.
Takagi, Shigeru; and Hattori, Yoshiyuki, to Nippon Soken, Inc. Gas bag protection apparatus for vehicles. 4,084,839, Cl. 280-736.000.
Takagi, Yasuo: *See*—
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; Sugihara, Kunihiko; and Takagi, Yasuo, 4,084,372, Cl. 60-278.000.
Takahashi, Katuhiko; Arimoto, Kyozo; Arai, Yoshiyuki; Morinaga, Tsuyoshi; and Nakazawa, Yuji, to Daicel Ltd. Process for preparing 4-oxopentadecanedioic acid. 4,085,274, Cl. 560-176.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, to Dai Nippon Toryo Co., Ltd.; and Nippon Hoso Kyokai. Gaseous discharge light emitting element. 4,085,351, Cl. 313-486.000.
Takamizawa, Akira; and Iwata, Tsuyoshi, to Shionogi & Co., Ltd. Cyclic phosphamide derivatives. 4,085,128, Cl. 260-456.00A.
Takashima, Yoshinori: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.
Takasugi, Tsuneji: *See*—
Watanabe, Kisuke; and Takasugi, Tsuneji, 4,084,990, Cl. 148-11.50R.
Takazawa, Yuzuru: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Takazawa, Yuzuru; and Seki, Yoichi, 4,084,403, Cl. 58-23.00D.
Takebe, Toshio; and Yamazaki, Takashi, to Eisai Co., Ltd. Water dispersible absorber for blood and the like. 4,084,591, Cl. 128-285.000.
Takeda Chemical Industries, Ltd.: *See*—
Nohara, Akira; Ishiguro, Toshihiro; and Sanno, Yasushi, 4,085,116, Cl. 260-308.00D.
Takenaka Komuten Co., Ltd.: *See*—
Kukino, Yoshinori; Miura, Mitsuo; and Aoyagi, Hayao, 4,084,383, Cl. 61-36.00R.
Taketani, Yutaka: *See*—
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,085,090, Cl. 260-49.000.
Takeuchi, Masato: *See*—
Nakajima, Fumito; Takeuchi, Masato; Matsuda, Shimpei; Uno, Shigeo; Mori, Toshikatsu; Watanabe, Yoshihisa; and Imanari, Makoto, 4,085,193, Cl. 423-239.000.
Talman, Woods G.: *See*—
Miles, Roscoe C.; Subrick, Joseph; and Talman, Woods G., 4,084,855, Cl. 299-64.000.
Tamburino, James C.: *See*—
Prosek, John R.; and Tamburino, James C., 4,084,852, Cl. 298-22.00C.
Tamori, Masato: *See*—
Adachi, Syozo; and Tamori, Masato, 4,085,058, Cl. 252-62.10L.
Tamura, Yukio: *See*—
Kondo, Masatsune; Sawami, Yoshiaki; and Tamura, Yukio, 4,084,847, Cl. 296-28.00R.
Tanaka, Ichiro: *See*—
Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; Sawada, Jiro; and Tanaka, Ichiro, 4,085,135, Cl. 260-520.00C.
Tanaka, Masaaki, to Rank Xerox, Ltd. Ambient temperature compensating device for power source apparatus for developing electrodes. 4,084,538, Cl. 118-4.000.
Tanaka, Shoji: *See*—
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.
Tanaka, Taro: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,084,551, Cl. 123-32.0SP.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,084,551, Cl. 123-32.0SP.
Tanaka, Yutaka, to Toytown Corporation. Toy helicopter. 4,084,345, Cl. 46-75.000.
Tanigami, Yoshinori: *See*—
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.
Taniguchi, Seiho; Kawasaki, Yoichi; and Sugawara, Shin' Ichi, to Nippon Unicar Company Limited. Semiconductive composition having controlled strippability. 4,085,249, Cl. 428-383.000.
Tanuma, Itsuo: *See*—
Honda, Toshio; Tanuma, Itsuo; Tanaka, Shoji; Iwami, Koichi; Fukuura, Yukio; Shibata, Shoson; and Suzuki, Yoshikatsu, 4,085,262, Cl. 526-46.000.
Tappan Company, The: *See*—
McFarland, Robert Henry, 4,084,571, Cl. 126-198.000.
Tashima, Norio: *See*—
Muto, Masayuki; Tashima, Norio; Kaieda, Shozo; and Kamimura, Kuniaki, 4,085,408, Cl. 346-75.000.
Tatsuoka, Yoshio: *See*—
Nakagawa, Kiyoshi; Otaki, Yukio; Mineo, Masatoshi; Aratani, Yoshio; Tatsuoka, Yoshio; and Kusakabe, Haruhiko, 4,084,622, Cl. 139-420.00R.
TBA Industrial Products Limited: *See*—
Freedman, Clive M., 4,084,977, Cl. 106-50.000.
Teague, Joe Doyle: *See*—
Cain, Gene; Teague, Joe Doyle; and Wright, Paul James, 4,084,381, Cl. 61-36.00C.
Technicon Instruments Corporation: *See*—
Pace, Salvatore J., 4,085,009, Cl. 204-1.00T.
Teco, Inc.: *See*—
Johnson, Leonard L., 4,084,619, Cl. 137-636.200.
Teijin Limited: *See*—
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,085,090, Cl. 260-49.000.
Kato, Sumio, 4,085,182, Cl. 264-171.000.
Teinturerie de Champagne: *See*—
Levielle, Jean, 4,084,412, Cl. 68-5.00C.
Tekno Industries, Inc.: *See*—
Karras, Ernest C., 4,085,293, Cl. 179-8.00A.
Telling, Ronald Charles; Passingham, Roy John; Kitchener, Brian Lewis; and Hopkinson, David George, to Burroughs Wellcome Co. Process for preparing vaccine. 4,085,203, Cl. 424-89.000.
Te Nijenhuis, Anne: *See*—
Den Otter, Marinus J. A. M.; Van Geenen, Albert A.; and Te Nijenhuis, Anne, 4,085,283, Cl. 544-214.000.
Teodoro, Donald J.: *See*—
Trexler, Ray W., Jr.; and Teodoro, Donald J., 4,084,276, Cl. 5-118.000.
Terajima, Yasuhiko; and Matsumoto, Osamu, to Rank Xerox, Ltd. Paper feeding roller. 4,084,807, Cl. 271-119.000.
TerEco Corporation: *See*—
Pequegnat, Willis E., 4,084,543, Cl. 119-3.000.
Ternehall, Runo Roy Oskar, to AB Volvo. Device for wear warning in a servo operated disc clutch. 4,084,671, Cl. 192-30.00W.
Terraillon: *See*—
Terraillon, Paul, 4,084,650, Cl. 177-174.000.
Terraillon, Paul, to Terraillon. Spring balance. 4,084,650, Cl. 177-174.000.
Teter, Robert D.; Maddock, James W.; and Rothers, Paul L., to King Radio Corporation. Pressure transducer with capacitor pick-up means. 4,084,439, Cl. 73-718.000.
Teumer, Roger G.: *See*—
Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 4,084,896, Cl. 355-3.00P.
Texas Instruments Incorporated: *See*—
Finnegan, Francis, 4,084,437, Cl. 73-361.000.
Grenier, Aime J., 4,085,393, Cl. 335-202.000.
Holcomb, Stanley W., 4,085,358, Cl. 320-9.000.
Linn, John Charles, 4,085,452, Cl. 365-5.000.
Textron Inc.: *See*—
Moertel, George B., 4,084,296, Cl. 24-205.130.
Tezuka, Minoru; and Kito, Yastami, to Nippon Otis Elevator Company; and Kabushiki Kaisha Meidensha. Control apparatus for an elevator system. 4,084,662, Cl. 187-29.00R.
Thackray, Malcolm, to Australian Atomic Energy Commission. Sources of nuclear radiation. 4,085,331, Cl. 250-493.000.
Thao, Do: *See*—
Mimoun, Hubert; Thao, Do; and Seree de Rochi, Irenee, 4,085,145, Cl. 260-592.000.
Thayer, Earl C.: *See*—
Mohrbacker, William J.; and Thayer, Earl C., 4,084,833, Cl. 280-81.00A.
Thiokol Corporation: *See*—
Hightower, James O.; Hamner, James W.; and Matthews, Richard L., 4,084,992, Cl. 149-17.000.
Thomas, Robert M.; and Gauthier, John A., to GTE Automatic Electric (Canada) Ltd. Control point driver circuit. 4,085,294, Cl. 179-16.0AA.
Thompson, Lester E. Blood leak detector. 4,085,047, Cl. 210-96.00M.
Thomson-Brandt: *See*—
Aigrain, Pierre; Broussaud, Georges; Peltier, Jean Paul; and Spitz, Erich, 4,085,426, Cl. 360-38.000.
Lainez, Lucien; Fichot, Bernard; and Bijon, Jean-Paul, 4,084,694, Cl. 206-444.000.
Thomson-CSF: *See*—
Croset, Michel; and Velasco, Gonzalo, 4,085,048, Cl. 210-321.00R.
Munier, Bernard, 4,085,348, Cl. 310-313.000.
Pircher, Georges, 4,084,903, Cl. 355-53.000.
Thomson, Roger: *See*—
Weik, Edward; and Thomson, Roger, 4,084,435, Cl. 73-299.000.
Thurston, Benjamin L., to Frost Packaging Company. Box construction. 4,084,720, Cl. 220-76.000.
Thyssen Industrie AG: *See*—
Dittrich, Erich; and Grone, Siegfried, 4,084,419, Cl. 72-68.000.
Tierney, William S.: *See*—
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,084,427, Cl. 73-88.00A.
Tinker, H. Burnham: *See*—
Gambell, James W.; and Tinker, H. Burnham, 4,085,275, Cl. 560-130.000.
Tinney, Francis John; and Nicolaides, Ernest D., to Parke, Davis & Company. New hexapeptides and methods for their production. 4,085,096, Cl. 260-112.5LH.
Toa Doro Kogyo Co., Ltd.: *See*—
Higuchi, Yoshiro; Harada, Yutaka; Sato, Toshio; Nakagawa, Koji; Kawaguchi, Iwazo; and Kasahara, Yasushi, 4,084,981, Cl. 106-96.000.

Tobias, Lamar: *See—*
Motyka, Jerry J.; and Lewis, Donald J., 4,084,676, Cl. 194-87.000.
Todd, John C., to Petro Canada Exploration Inc.; Canada-Cities Services, Ltd.; and Imperial Oil Limited. Method of producing viscous materials from subterranean formations. 4,084,637, Cl. 166-245.000.
Todd, John C., to Petro Canada Exploration Inc.; Canada-Cities Services, Ltd.; and Imperial Oil Limited. Electrode well for electrically heating a subterranean formation. 4,084,639, Cl. 166-248.000.
Tojo, Akio; and Ohnishi, Kimimasa, to Nissan Motor Company, Limited. Fluid jet loom with a yarn waste removing apparatus. 4,084,623, Cl. 139-435.000.
Tokico Ltd.: *See—*
Haraikawa, Tetsuo, 4,084,664, Cl. 188-71.900.
Karasudani, Yasuo, 4,084,666, Cl. 188-73.300.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Hirabayashi, Kanji, 4,085,459, Cl. 365-222.000.
Mashimo, Michiya; and Shinada, Hidehiro, 4,084,871, Cl. 316-19.000.
Toler, David F.: *See—*
Morris, Edwin, Jr.; and Toler, David F., 4,084,919, Cl. 415-136.000.
Tomizawa, Masaharu: *See—*
Endo, Tomizo; Sumida, Yutaka; Kawahara, Toru; Ohtake, Masaichi; Motokawa, Shoichi; Nagayama, Keiji; Shigeta, Masatomo; Hozuma, Hiroshi; Tomizawa, Masaharu; and Kikuchi, Hideo, 4,085,034, Cl. 208-48.00R.
Tomlinson, John Parker: *See—*
Briston, Rodney John; Canning, Rodger George; and Tomlinson, John Parker, 4,085,239, Cl. 427-208.000.
Tompsett, Michael Francis, to Bell Telephone Laboratories, Incorporated. Charge transfer imaging devices. 4,085,456, Cl. 365-114.000.
Tomy Kogyo Co., Inc.: *See—*
Ishida, Hajime; and Tsumita, Mitsuyo, 4,084,849, Cl. 297-22.000.
Toray Industries Inc.: *See—*
Nakagawa, Kiyoshi; Otaki, Yukio; Mineo, Masatoshi; Aratani, Yoshio; Tatsuoka, Yoshio; and Kusakabe, Haruhiko, 4,084,622, Cl. 139-420.00R.
Toyo Kogyo Co., Ltd.: *See—*
Satow, Haruhiko, 4,084,549, Cl. 123-217.000.
Toyo Umpanki Co., Ltd.: *See—*
Morishita, Seishi, 4,084,670, Cl. 192-13.00R.
Toyonaga, Ryuya: *See—*
Kagami, Akiyasu; Hase, Takashi; Hiraki, Minoru; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,350, Cl. 313-486.000.
Takahashi, Koichi; Narita, Kinichiro; Kagami, Akiyasu; Hase, Takashi; Mimura, Yoshiyuki; Tanigami, Yoshinori; Koike, Junro; Toyonaga, Ryuya; and Kojima, Takehiro, 4,085,351, Cl. 313-486.000.
Toyota, Akinori; Odawara, Kiyoshi; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for preparing highly stereoregular polymers or copolymers of α-olefins containing at least three carbon atoms, and catalysts used therefor. 4,085,276, Cl. 526-122.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hashimoto, Masanao; Saitou, Tadashi; Kobayashi, Tatsuo; and Suzuki, Isamu, 4,084,373, Cl. 60-293.000.
Hayashi, Toshiaki; Sugiura, Hiroshi; Ozaki, Toshio; Sugimoto, Eiji; and Banno, Yukio, 4,084,841, Cl. 280-745.000.
Kondo, Masatsune; Sawami, Yoshiaki; and Tamura, Yukio, 4,084,847, Cl. 296-28.00R.
Toytown Corporation: *See—*
Tanaka, Yutaka, 4,084,345, Cl. 46-75.000.
Tractel S.A.: *See—*
Desplats, Andre; and Cavalieri, Michel, 4,084,788, Cl. 254-76.000.
Tragert, William, to KTA Corporation. Fluid proportioning device. 4,084,616, Cl. 137-625.400.
Trexler, Ray W., Jr.; and Teodoro, Donald J., to PACCAR Inc. Swing-away bunk. 4,084,276, Cl. 5-118.000.
Tritsch, Ludwig, to Johnson & Johnson. Disposable prefolded diaper with permanently attached adhesive closure system. 4,084,592, Cl. 128-287.000.
TRW Inc.: *See—*
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,084,427, Cl. 73-88.00A.
Jenkins, John C., 4,085,307, Cl. 219-98.000.
Tsuchiya, Shozo; Hayashi, Hideo; Iida, Kazuyoshi; and Goto, Kiyoshi, to Nippon Oil Company, Limited. Curable coating compositions. 4,085,085, Cl. 260-38.000.
Tsumita, Mitsuyo: *See—*
Ishida, Hajime; and Tsumita, Mitsuyo, 4,084,849, Cl. 297-22.000.
Tsunoda, Yoshito; Maeda, Takeshi; and Oshida, Yoshitada, to Hitachi, Ltd. Information reproducing apparatus with plural beam readout. 4,085,423, Cl. 358-128.000.
Tsuruda, Mineo: *See—*
Oe, Takanori; and Tsuruda, Mineo, 4,085,111, Cl. 260-296.00H.
Tsutsui, Kunio: *See—*
Fujiura, Takashi; Tsutsui, Kunio; and Nishida, Hiroshi, 4,084,531, Cl. 114-211.000.
Tsutsumino, Takeyoshi, to Kabushiki Kaisha Taiheiseisakusho. Method and an apparatus for producing a coiled spring. 4,084,420, Cl. 72-138.000.
Tsygulev, Leonid Nikiforovich: *See—*
Movshovich, Pavel Mikhailovich; Khavkin, Viktor Pavlovich; Maximov, Gennady Konstantinovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Kulikov, Vasily Ivanovich; Shkrabov, Boris Semenovich; Nezelenov, Sergei Vladimirovich; Shutov, Gennady Nikolaevich; Tsygulev, Leonid Nikiforovich; and Ilin, Vadim Sergeevich, 4,084,400, Cl. 57-156.000.
Tuck, Richard L.: *See—*
Kunz, Andrew M.; Yates, Donald B.; and Tuck, Richard L., 4,084,515, Cl. 105-240.000.
Tucker, Howard, to Imperial Chemical Industries Limited. Optically-active 1-aryloxy-2-propanol intermediates of (s)-absolute configuration. 4,085,136, Cl. 260-559.00D.
Tucker, Zane G. Visible message display apparatus. 4,084,337, Cl. 40-472.000.
Tulagin, Vsevolod: *See—*
Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 4,084,896, Cl. 355-3.00P.
Tulpule, Bhalchandra Ramchandra, to Burroughs Corporation. Performance invarient execution unit for non-communicative instructions. 4,085,450, Cl. 364-900.000.
Turbomachines, Inc.: *See—*
Pavlecka, Vladimir H., 4,084,918, Cl. 415-1.000.
Turcotte, Ronald E.; and Hunt-Grubbe, Robert H., to Schlumberger Technology Corporation. Calibrator for radioactivity well logging tools. 4,085,323, Cl. 250-252.000.
Turk, Chester F.; and Krapcho, John, to E. R. Squibb & Sons, Inc. 2-Aryl-6-arylidene-1-(substituted aminoalkoxy)-1-cyclohexenes. 4,085,142, Cl. 260-570.5CA.
Turk, Chester F.: *See—*
Krapcho, John; and Turk, Chester F., 4,085,280, Cl. 544-140.000.
Turk, Chester Frank: *See—*
Krapcho, John; and Turk, Chester Frank, 4,085,102, Cl. 542-450.000.
Turner, George, Jr.: *See—*
Burgarella, John P.; Turner, George, Jr.; and Stephansky, Robert L., 4,085,414, Cl. 354-145.000.
Turner, Newton C., Jr., to Genesco, Inc. Method of making mudguard style shoe. 4,084,279, Cl. 12-142.00R.
Turover, Alan S., to Castle & Cooke, Inc. Food product made from mushroom stumps and method for manufacturing the same. 4,085,233, Cl. 426-615.000.
Turski, Zygmond; and Rosen, Arye, to RCA Corporation. Microwave frequency discriminator comprising a one port active device. 4,085,377, Cl. 329-116.000.
Tyler, Tommy N., to Powers Regulator Company. Pneumatic delivery system. 4,084,769, Cl. 243-3.000.
U C B, Societe Anonyme: *See—*
Marsiat, Arthur, 4,085,159, Cl. 260-835.000.
U-S Safety Trolley Corporation: *See—*
Ross, Donald R., 4,084,301, Cl. 29-33.00K.
Ueda, Motohiko: *See—*
Adachi, Ikuo; Ueda, Motohiko; and Kimoto, Sadatoshi, 4,085,114, Cl. 260-307.0DA.
Unarco Industries, Inc.: *See—*
Upshaw, Clarence Ward, 4,084,832, Cl. 280-33.99S.
Union Carbide Corporation: *See—*
Engel, Stephen August; and Fuhrhop, Ronald Elmer, 4,084,988, Cl. 148-9.500.
Ginsberg, Thomas, 4,084,971, Cl. 106-1.170.
Quets, Jean Marie; and Hatwell, Henri, 4,085,037, Cl. 209-1.000.
Sipusic, Frank; and Sheridan, Arthur L., 4,084,466, Cl. 83-193.000.
Union Corporation, The: *See—*
Schorsch, John B.; Graul, William E.; and Barash, David, 4,084,387, Cl. 62-63.000.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Kimberley, David, 4,084,774, Cl. 244-194.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Raynes, Edward Peter, 4,084,884, Cl. 350-334.000.
Salter, David Anthony; Scilly, Norman Frederick; and Watson, Keith Ellis, 4,085,152, Cl. 260-645.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittannic Majesty's Government of the: *See—*
Harris, Gordon Colin; Vere, Robert Paul; and Walker, Ronald, 4,084,530, Cl. 114-183.00R.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Boyle, Henry Bryant; and Johnson, Alexander James, 4,084,430, Cl. 73-141.00R.
United States of America
Agriculture: *See—*
Komanowsky, Michael; and Sinnamon, Howard I., 4,085,044, Cl. 210-45.000.
Air Force: *See—*
Schneider, Josef F., 4,085,444, Cl. 364-900.000.
Army: *See—*
Deitz, Paul H.; Durfee, Gary L.; and Wolff, Stephen S., 4,085,319, Cl. 250-199.000.
Hose, Eddy, 4,085,440, Cl. 364-454.000.
Poirier, Robert H.; and Poziomek, Edward J., 4,085,112, Cl. 260-304.00C.
Health, Education and Welfare: *See—*
Poirier, Victor L.; and Keiser, John T., 4,084,266, Cl. 3-1.000.
Interior: *See—*

Henrie, Thomas A.; Lindstrom, Roald E.; and Lei, Kenneth P. V., 4,085,017, Cl. 204-123.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Sawyer, Craig D. Control for nuclear thermionic power source. 4,085,004, Cl. 176-22.000.
Wilhelm, Horst E. Apparatus for extraction and separation of a preferentially photo-dissociated molecular isotope into positive and negative ions by means of an electric field. 4,085,332, Cl. 250-528.000.
National Aeronautics and Space Administration: *See*—
Baehr, Edward F., 4,084,612, Cl. 137-484.200.
Evans, John C., Jr., 4,084,985, Cl. 136-89.00P.
Ludwig, Lawrence P., 4,084,825, Cl. 277-25.000.
Sheibley, Dean W., 4,085,241, Cl. 427-385.00B.
Navy: *See*—
Couch, Harold Thompson; Cohen, Leonard Selwyn; and Coulter, Lawrence Joseph, 4,084,781, Cl. 249-83.000.
Moscrip, William Matthew, 4,084,480, Cl. 89-42.00B.
San Miguel, Anthony, 4,084,512, Cl. 102-103.000.
Svrjcek, Benjamin W., Jr., 4,084,511, Cl. 102-70.2GA.
U.S. Philips Corporation: *See*—
Asselman, George Albert Apolonia; Van der AA, Herman Henricus Maria; and Meijer, Roelf Jan, 4,084,376, Cl. 60-523.000.
Compen, Johannes Maria Azalina Antonius, 4,085,235, Cl. 427-64.000.
Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, 4,085,310, Cl. 219-502.000.
Franssen, Nico Valentinus, 4,084,471, Cl. 84-1.010.
Gerkema, Jan T.; and Gorter, Frederik Willem, 4,085,430, Cl. 360-119.000.
Janssen, Casper Johannes Gerardus Ferdinand; Postma, Lambertus; and Lippits, Gerardus Johannes Meinardus, 4,084,968, Cl. 96-48.0PD.
Lippits, Gerardus Johannes Meinardus; Janssen, Petrus Johannes; Debruijn, Henricus Antonius; and van Ruler, Johannes, 4,085,285, Cl. 174-68.500.
Monte, George Leendert Adriaan, 4,085,328, Cl. 250-416.0TV.
Parkyn, Derek J., 4,085,342, Cl. 307-260.000.
Schiek, Burkhard; and De Ronde, Frans Christiaan, 4,085,391, Cl. 333-33.000.
van der Poel, Johannes; and Noordanus, Johannes, 4,085,370, Cl. 325-348.000.
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Morris, Edwin, Jr.; and Toler, David F., 4,084,919, Cl. 415-136.000.
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Eastman, Jay Morgan; and Refermat, Stanley J., 4,084,883, Cl. 350-152.000.
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Uno, Yoshihiro. Color image pick-up system using strip filter. 4,085,418, Cl. 358-44.000.
UOP Inc.: *See*—
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,085,154, Cl. 260-668.00D.
Pollitzer, Ernest L.; and Hayes, John C., 4,085,067, Cl. 252-442.000.
Upaya, Inc.: *See*—
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Upjohn Company, The: *See*—
Kornis, Gabriel; Nidy, Eldon G.; Vostral, Henry J.; and Steinhards, Arnolds, deceased, 4,084,955, Cl. 71-92.000.
Nelson, Norman A., 4,085,120, Cl. 260-343.600.
Nelson, Norman A., 4,085,139, Cl. 260-563.00R.
Yankee, Ernest W., 4,085,271, Cl. 560-121.000.
Upshaw, Clarence Ward, to Unarco Industries, Inc. Shopping cart with anti-pilferage character. 4,084,832, Cl. 280-33.99S.
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Van Auken, Richard L., to Exxon Research & Engineering Co. Golf club shaft for irons. 4,084,819, Cl. 273-80.00R.
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van der Lely, Cornelis, to C. van der Lely N.V. Harvester. 4,084,394, Cl. 56-14.600.
van der Lely, Cornelis, to C. van der Lely N.V. Driving mechanisms and housings for such mechanisms. 4,084,485, Cl. 91-210.000.
van der Poel, Johannes; and Noordanus, Johannes, to U.S. Philips Corporation. Radio receiver having co-channel interference operated squelch. 4,085,370, Cl. 325-348.000.
VanderVeen, Jaring, to Bendix Corporation, The. Drive key heat shield and support for wheel rim heat shield of multiple disc brake. 4,084,857, Cl. 301-6.00A.
van der Vliet, William Ewald, to Ferro Corporation. Electrophoretic porcelain enameling process. 4,085,021, Cl. 204-181.00N.
Van Geenen, Albert A.: *See*—
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van Nederveen, Hans Bertil, to SKF Industrial Trading & Development Company B.V. Rock bit. 4,084,649, Cl. 175-366.000.
Van Ness, Bradford O., to Engineered Systems, Inc. Automatic product-dispensing system. 4,085,313, Cl. 235-419.000.
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Van Scoy, Robert W., to Shell Oil Company. Selective removal of hydrogen sulfide from gaseous mixtures. 4,085,192, Cl. 423-226.000.
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Vassileff, Neiko I. Sequestering compositions. 4,085,060, Cl. 252-180.000.
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Vaughn, Daniel J. Apparatus for manufacturing foamed plastics. 4,084,795, Cl. 366-177.000.
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Venaleck, Howard J. Face mask. 4,084,585, Cl. 128-146.200.
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Vidnovic, Sam S. Magnetic collection device for bingo chips and similar game parts. 4,084,821, Cl. 273-148.00R.
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Vigoureux, Francis E. Apparatus for focusing and using solar energy. 4,084,581, Cl. 126-271.000.
Villalobos, Humberto Fernandez-Moran. Ultrasharp diamond edges and points and method of making. 4,084,942, Cl. 51-307.000.
Villella, Tony R. Internal combustion engine. 4,084,556, Cl. 123-75.00B.
Virgilio, Joseph A.; and Manowitz, Milton, to Givaudan Corporation. N,N'-bis-aromaticformamidines useful as sunscreening agents. 4,085,062, Cl. 252-300.000.
Vischer, Alfred, Jr., deceased (by Vischer, Peter, executor), to Vischer Optics, Inc. Eyeglass frame. 4,084,889, Cl. 351-121.000.
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Vischer, Peter, executor: *See*—
Vischer, Alfred, Jr., deceased, 4,084,889, Cl. 351-121.000.
Viswanathan, Lakshminarasimhan, to Computer Peripherals, Inc. Phase locked loop decoder. 4,085,288, Cl. 178-69.100.
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Voll, Walter: *See*—
vor der Bruck, Rolf; and Voll, Walter, 4,084,838, Cl. 280-715.000.
Volpin, Mark Efimovich: *See*—
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Von Hagel, Leo J., to Honeywell Farms, Inc. Apparatus for printing and feeding caps to a bottle capping machine. 4,084,392, Cl. 53-131.000.
von Platen, Baltzar, to Fondation Cum Plate. Method of recovering

energy by means of a cyclic thermodynamic process. 4,084,408, Cl. 62-467.00R.
vor der Bruck, Rolf; and Voll, Walter, to Ford Motor Company. Motor vehicle rear axle suspension. 4,084,838, Cl. 280-715.000.
Vossieck, Paul; and Deuring, Hans, to GOETZEWERKE Friedrich Goetze AG. Shaft seal ring. 4,084,826, Cl. 277-134.000.
Vostral, Henry J.: *See—*
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W-K-M Wellhead Systems, Inc.: *See—*
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W. R. Grace & Co.: *See—*
Weston, Joseph F. R., 4,085,231, Cl. 426-410.000.
Wacker, Adolf; Wacker, Dorthe; Pohler, Klaus; and Mittenzwei, Hellmut, to Mittenzwei, Helmut. Process for obtaining insulin like active substances. 4,085,204, Cl. 424-101.000.
Wacker Chemie GmbH: *See—*
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Wacker, Dorthe: *See—*
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Wadsworth, Brent Earl, to Varian Associates, Inc. Compression seal for elastomeric septum. 4,084,718, Cl. 215-247.000.
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Wahi, Chander Mohan, to E. F. Johnson Company. Connector. 4,084,878, Cl. 339-99.00R.
Walchuk, George P., to Exxon Research & Engineering Co. Coal liquefaction with subsequent bottoms pyrolysis. 4,085,031, Cl. 208-8.000.
Walker, James B. Pantograph apparatus. 4,084,483, Cl. 90-13.300.
Walker, Ronald: *See—*
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Wall, Bill R., to Power Controls Corporation. Electrical power control assembly. 4,085,399, Cl. 338-200.000.
Wallace, Bernard E., to B. E. Wallace Products Corporation. Hoist or winch mechanism adapted for multiple variable rigging. 4,084,794, Cl. 254-189.000.
Wallace Business Forms, Inc.: *See—*
Heimann, Edward W., 4,084,741, Cl. 229-69.000.
Wallace, William K., to Chicago Pneumatic Tool Company. Pulse motor in a nut runner. 4,084,487, Cl. 91-325.000.
Wallbaum, Hellmut, to Volkswagenwerk Aktiengesellschaft. Speed control apparatus for an internal combustion engine. 4,084,559, Cl. 123-102.000.
Waloszyk, John S.; and Jacobs, Bernard W. System for visual communication. 4,084,332, Cl. 35-9.00G.
Walsh, Dale M.; and Nordling, Karl I., to Paradyne Corporation. Digital modem. 4,085,449, Cl. 364-900.000.
Walter, Derek Oscar, to Johnson, Matthey & Co., Limited. Accelerometers. 4,084,443, Cl. 73-517.00R.
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Ward, John Lionel Raymond. Drive-transmitting mechanisms. 4,084,451, Cl. 74-867.000.
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Warmann, Bruno D. Pneumatic tube conveyor dispatcher. 4,084,770, Cl. 243-25.000.
Warshawsky, Abraham: *See—*
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Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., to Xerox Corporation. Photoelectrophoretic web imaging apparatus. 4,084,896, Cl. 355-3.00P.
Washnock, Robert S.; and Madzay, Delbert R. Toe board and measuring means. 4,084,813, Cl. 272-106.000.
Watanabe, Kazuhiko: *See—*
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Weaver, Austin S., to Ottawa Roof Truss, Inc. Truss making apparatus. 4,084,498, Cl. 100-210.000.
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Wechsung, Reiner; and Kirschner, Jurgen, to Leybold-Heraeus GmbH & Co. Kommandit-Gesellschaft. Method and apparatus for controlling the removal, by means of ion etching, of a thin layer from a substrate. 4,085,022, Cl. 204-192.00E.
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Wedemeyer, Karlfried; Kiel, Wolfgang; and Evertz, Werner, to Bayer Aktiengesellschaft. Process for the preparation of anilines meta-substituted by chlorine. 4,085,141, Cl. 260-570.00R.
Wehmeyer, Richard L. Holder and operating table for swine and other animals. 4,084,544, Cl. 119-103.000.
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Weik, Edward; and Thomson, Roger, to Petrometer Corporation. System for measuring water level in gasoline tank. 4,084,435, Cl. 73-299.000.
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Weisenburger, Lawrence P., to Clare-Pendar Co. Contactless key switch. 4,085,394, Cl. 336-20.000.
Weiss, Allen. Ring light converter for electronic flash units. 4,085,436, Cl. 362-16.000.
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Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, to U.S. Philips Corporation. Oxime ethers having anti-depressive activity. 4,085,225, Cl. 424-304.000.
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Gilmour, George A., 4,085,421, Cl. 358-81.000.
Liu, Chia-tsun, 4,085,063, Cl. 252-387.000.
Quan, Wing C.; Edison, David M.; Hummert, George T.; and Sackin, Milton, 4,084,661, Cl. 187-29.00R.
Smith, James D. B., 4,085,250, Cl. 428-418.000.
Weston, Joseph F. R., to W. R. Grace & Co. Container evacuation process. 4,085,231, Cl. 426-410.000.
Westran Corporation: *See—*
Dalton, Thomas B., 4,084,447, Cl. 74-89.140.
Wheeler, Bradford J. Lapidary machine. 4,084,352, Cl. 51-127.000.
Wheeler, Robert G., to Wood Processes, Oregon Ltd. Method of making a grooved, fiber-clad plywood panel. 4,084,996, Cl. 156-257.000.
Whirlpool Corporation: *See—*
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Skinner, Frank R., II, 4,084,684, Cl. 198-467.000.
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White, James F.; Shaw, Wilfrid G.; and Applequist, Michael D., to Standard Oil Company (Ohio), The. Process for the preparation of unsaturated acids from unsaturated aldehydes. 4,085,065, Cl. 252-437.000.
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White, Thomas L., to Raymond Lee Organization, Inc., The, a part interest. Trash can securing device. 4,084,701, Cl. 211-81.000.
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Whitehouse, David John, to Rank Organisation Limited, The. Measuring instrument. 4,084,324, Cl. 33-174.00L.
Whiting, Cuthbert R., to Probe, Incorporated. Method of production stimulation and enhanced recovery of oil. 4,084,638, Cl. 166-248.000.
Whitney, Thomas A., to Exxon Research & Engineering Co. Process for optical resolution of crude trans-1,2-cyclohexanediamine. 4,085,138, Cl. 260-563.00R.
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Wiley, Nathaniel C., Jr.; and Jensen, William L., Jr., to Rudkin-Wiley Corporation. Universal support assembly for drag reducing equipment. 4,084,846, Cl. 296-1.00S.
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Willard, John Wesley, Sr., to Caw Industries, Inc. Process for treating solid carbonaceous fossil fuels and the products thus prepared. 4,084,938, Cl. 44-1.00R.
Willenbrock, Walter; and Winkler, Helmut, to Eumuco Aktiengesellschaft fur Maschinenbau. Device for controlling the manipulator movements in a forming machine, in particular in a hammer forging press. 4,084,418, Cl. 72-31.000.
Williams, John Chamberlin; and Sisco, William Braxton, to RCA Corporation. Method and detection of phase and frequency modulation. 4,085,367, Cl. 325-67.000.
Williams, Melvin L. Poultry-handling system. 4,084,714, Cl. 214-515.000.
Williams, Paul, to Industrial Nucleonics Corporation. Radiation reflection method and apparatus particularly for gauging materials exhibiting broadband absorption or scattering, or similar effects. 4,085,326, Cl. 250-339.000.
Williams, Winfried Wilbur, Sr.; and Clancy, David, to Colgate-Palmolive Company. Automatic packaging apparatus. 4,084,391, Cl. 53-120.000.
Williford, Jerry G., to Rockwell International Corporation. Biquad RC active filter. 4,085,380, Cl. 330-107.000.
Willis, David John; Stevenson, Dennis Clifford; and Bettle, William, to Betstone Industries Limited. Turning bed. 4,084,274, Cl. 5-61.000.
Wilson, Charles A., to General Signal Corporation. Mixing apparatus. 4,085,463, Cl. 366-176.000.
Wilson, Charles Edwin, Jr., to Wilson, Charles Edwin, Jr. Fire damper. 4,084,744, Cl. 236-49.000.
Wilson, William G.: *See—*
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Wisdom, Norvell E., Jr.: *See—*
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Wisebaker, Robert E.: *See—*
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Wiseblood, Nathan. Method for reconditioning and resurfacing pavement. 4,084,915, Cl. 404-77.000.
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Wixon, Harold Eugene: *See—*
Giordano, Annie Sue; Burke, Richard Lerda; and Wixon, Harold Eugene, 4,085,243, Cl. 427-387.000.
Wolf, Franz-Josef. Joint for pipes. 4,084,827, Cl. 277-168.000.
Wolf, John C.; and Costello, Thomas G., to Controlex Corporation of America. Flexible coupling for rotatable shafts. 4,084,409, Cl. 64-11.00B.
Wolfe, John Edmond, to Burroughs Corporation. Focused ion beam mask maker. 4,085,330, Cl. 250-492.00A.
Wolfe, Robert W., to Clark Equipment Company. Escapement assembly for shift control mechanism. 4,084,448, Cl. 74-475.000.
Wolff, Stephen S.: *See—*
Deitz, Paul H.; Durfee, Gary L.; and Wolff, Stephen S., 4,085,319, Cl. 250-199.000.
Wolter, Brigitte: *See—*
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Wolter, Heinz; and Wolter, Brigitte, to Wolter, Heinz. Light connectable with a key. 4,085,315, Cl. 362-116.000.
Wolters, Tjako Aaldrik; and de Koning, Jan, to Ballast-Nedam Groep N.V.; and Amsterdamse Ballast Bagger. Suction dredge with swell compensating ladder mount. 4,084,334, Cl. 37-67.000.
Woltersdorf, Otto W., Jr.: *See—*
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Cragoe, Edward J., Jr.; Woltersdorf, Otto W., Jr.; and Habecker, Charles N., 4,085,211, Cl. 424-250.000.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 4,085,219, Cl. 424-269.000.
Wolverine World Wide, Inc.: *See—*
Harlan, Martin L.; Krause, John A.; and Brooks, Ronald L., 4,084,292, Cl. 17-50.000.
Wolverton, Kenneth Harlan: *See—*
McIntyre, Robert Alfred; and Wolverton, Kenneth Harlan, 4,085,303, Cl. 200-61.410.
Wondolowski, Lawrence: *See—*
Gibbons, John P.; and Wondolowski, Lawrence, 4,085,076, Cl. 260-17.200.
Wong, Eunice K. T.: *See—*
Milberger, Ernest C.; Bremer, Noel J.; and Wong, Eunice K. T., 4,085,121, Cl. 260-346.750.
Woo, Ming Cho, to National Casein of New Jersey. Pre-mixed catalyzed vinyl acetate polymer adhesive composition. 4,085,074, Cl. 260-17.00R.
Wood, Cecil Howard. Apparatus and method of manufacturing flexible ducting. 4,084,309, Cl. 29-561.000.
Wood, Derek A.: *See—*
Rosinger, Herbert P.; Wood, Derek A.; and Sheldon, Roger A., 4,085,147, Cl. 260-600.00R.
Wood, Peter: *See—*
MacKenzie, Raymond W.; Wood, Peter; Heinrich, Theodore M.; and Oates, Robert M., 4,085,300, Cl. 219-10.49R.
Wood Processes, Oregon Ltd.: *See—*
Wheeler, Robert G., 4,084,996, Cl. 156-257.000.
Woodbine Corporation: *See—*
Cain, Gene; Teague, Joe Doyle; and Wright, Paul James, 4,084,381, Cl. 61-36.00C.
Woodward Governor Company: *See—*
McConnell, Robert G., 4,085,373, Cl. 328-141.000.
Wrasman, Thomas J. Molding tool for making valve. 4,084,783, Cl. 249-175.000.
Wright, James E.: *See—*
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,084,427, Cl. 73-88.00A.
Wright Machinery Company Limited: *See—*
Sharp-Dent, Charles Edward Arthur; and Hounsell, John Owen, 4,084,652, Cl. 177-207.000.
Wright, Paul James: *See—*
Cain, Gene; Teague, Joe Doyle; and Wright, Paul James, 4,084,381, Cl. 61-36.00C.
Wristers, Harry J., to Exxon Research & Engineering Co. Purple $TiCl_3$ by direct low temperature reduction. 4,085,064, Cl. 252-429.00B.
Wristers, Jos, to Exxon Research & Engineering Co. Hydrogenation process using noble metal catalysts promoted by liquid fluorine containing acids. 4,085,035, Cl. 208-143.000.
Xerox Corporation: *See—*
Deetz, David R., 4,084,680, Cl. 197-19.000.
De Vito, Michael G.; and Wieloch, Francis J., 4,085,245, Cl. 428-215.000.

Haas, Werner E. L.; Adams, James E.; and Mechlowitz, Bela, 4,084,966, Cl. 96-1.0PS.
Looney, John H., 4,084,809, Cl. 271-220.000.
Okumura, Koji, 4,085,455, Cl. 365-112.000.
Sliva, Philip O., 4,085,321, Cl. 250-211.00R.
Warter, Peter J., Jr.; Squassoni, Gino F.; Tulagin, Vsevolod; Teumer, Roger G.; and Egnaczak, Raymond K., 4,084,896, Cl. 355-3.00P.

Yagher, Charles, Jr., to Emerson Electric Co. Electrical switching device for thermal and overvoltage protection. 4,085,397, Cl. 337-407.000.

Yahiro, Teruo; and Yoshida, Hiroshi, to Kajima Corporation; and Chemical Grout Company, Limited. Process for the high-pressure grouting within the earth and apparatus adapted for carrying out same. 4,084,648, Cl. 175-67.000.

Yamada, Masanori: *See*—
Niwata, Tatuji; Okubo, Kazutomo; Nakanishi, Fumio; and Yamada, Masanori, 4,085,422, Cl. 358-118.000.

Yamagata, Ichiki, to Oji-Yuka Synthetic Paper Sales Co., Ltd. Packaging article. 4,084,689, Cl. 206-280.000.

Yamaguchi, Hiroaki: *See*—
Hattori, Tadashi; Yamaguchi, Hiroaki; and Nakase, Takamichi, 4,084,563, Cl. 123-119.0EC.

Yamaguchi, Kiyoshi: *See*—
Hasegawa, Kunio; Nishimura, Hidetomo; and Yamaguchi, Kiyoshi, 4,085,343, Cl. 310-52.000.

Yamai, Fumito: *See*—
Saito, Fumio; Yamai, Fumito; Beppu, Yositugu; and Nakayama, Shinpei, 4,085,169, Cl. 260-886.000.

Yamamoto, Hisao: *See*—
Katsube, Junki; Kojima, Atsuyuki; Sunagawa, Makoto; Takashima, Yoshinori; Kameno, Yoshito; and Yamamoto, Hisao, 4,085,210, Cl. 424-248.400.

Yamamoto, Satomi; Yoshii, Masataka; Matsuo, Teruo; and Yokoozi, Teruo, to Nippon Steel Corporation. Method for continuous refining of a molten iron base metal. 4,084,959, Cl. 75-53.000.

Yamamoto, Stephen K., to International Telephone and Telegraph Corporation. Electrical connector. 4,084,875, Cl. 339-94.00M.

Yamanaka, Akira: *See*—
Maeda, Keisuke; and Yamanaka, Akira, 4,085,410, Cl. 354-21.000.

Yamaoka, Sadao; and Arai, Kenichi, to Minolta Camera Kabushiki Kaisha. Jam detecting device in the electrophotographic copying machine. 4,084,900, Cl. 355-14.000.

Yamasaki, Yorio: *See*—
Itoh, Masaki; and Yamasaki, Yorio, 4,084,656, Cl. 180-103.00R.

Yamashita, Katusuke: *See*—
Ohsako, Kyoichi; and Yamashita, Katusuke, 4,085,311, Cl. 235-92.0FP.

Yamashita, Keiji: *See*—
Ishikawa, Tatsuo; Yamashita, Keiji; Okubo, Norio; Sakashita, Masahira; Okamoto, Arimichi; and Kusunose, Tetsuhiro, 4,085,174, Cl. 264-49.000.

Yamazaki, Takashi: *See*—
Takebe, Toshio; and Yamazaki, Takashi, 4,084,591, Cl. 128-285.000.

Yang, Kei-Hsiung: *See*—
Swank, Robert K.; and Yang, Kei-Hsiung, 4,085,327, Cl. 250-370.000.

Yankee, Ernest W., to Upjohn Company, The. 5-Oxa-cis-13-PGF_1 compounds. 4,085,271, Cl. 560-121.000.

Yasuda, Kazuyoshi: *See*—
Nakano, Tatsuya; Yasuda, Kazuyoshi; and Miwa, Takeshi, 4,084,760, Cl. 242-18.00A.

Yasuda, Michio: *See*—
Kawakami, Takajiro; Mizuno, Minesilo; Okushi, Akira; and Yasuda, Michio, 4,085,237, Cl. 427-150.000.

Yasuoka, Akihiko; and Shibata, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing complementary MOS integrated circuit. 4,084,311, Cl. 29-571.000.

Yates, Donald B.: *See*—
Kunz, Andrew M.; Yates, Donald B.; and Tuck, Richard L., 4,084,515, Cl. 105-240.000.

Yawamura Glass Kabushiki Kaisha: *See*—
Shimoiizaka, Junzo; Konosu, Akira; Hayashi, Yuzo; Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,084,755, Cl. 241-95.000.

Yazaki Sogyo Kabushiki Kaisha: *See*—
Ishibashi, Toshihiro, 4,084,578, Cl. 126-271.000.

Yeda Research and Development Co., Ltd.: *See*—
Patchornik, Avraham; Warshawsky, Abraham; Fridkin, Matityahu; and Kalir, Rami, 4,085,261, Cl. 526-19.000.

Yeh, Yu Shuan, to Bell Telephone Laboratories, Incorporated. Interference canceling method and apparatus. 4,085,368, Cl. 325-304.000.

Yen, Yao T., to Intel Corporation. Interconnector for integrated circuit package. 4,084,869, Cl. 339-17.0CF.

Yerges, Lyle F.: *See*—
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,366, Cl. 52-615.000.
Saylor, Charles J.; Haworth, Richard G.; and Yerges, Lyle F., 4,084,367, Cl. 52-615.000.

Ying Mfg. Corporation: *See*—
Yu, Ying-Nien, 4,084,579, Cl. 126-271.000.

Yokomori, Sadakazu: *See*—
Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; Sawada, Jiro; and Tanaka, Ichiro, 4,085,135, Cl. 260-520.00C.

Yokoozi, Teruo: *See*—
Yamamoto, Satomi; Yoshii, Masataka; Matsuo, Teruo; and Yokoozi, Teruo, 4,084,959, Cl. 75-53.000.

Yoshida, Hiroshi: *See*—
Yahiro, Teruo; and Yoshida, Hiroshi, 4,084,648, Cl. 175-67.000.

Yoshida, Yuzuru, to Aupac Kabushiki Kaisha. Brush device for miniature electric motor. 4,085,346, Cl. 310-246.000.

Yoshii, Masataka: *See*—
Yamamoto, Satomi; Yoshii, Masataka; Matsuo, Teruo; and Yokoozi, Teruo, 4,084,959, Cl. 75-53.000.

Yoshimura, Hiromitsu: *See*—
Kuroda, Masahiro; and Yoshimura, Hiromitsu, 4,085,389, Cl. 332-31.00T.

Yoshino, Masaki, to Fuji Xerox Co., Ltd. Array of optical projection devices. 4,084,894, Cl. 353-34.000.

Yoshino, Takeshi, to Fuji Photo Optical Co., Ltd. Device for recording information on a film in a photographic camera. 4,085,412, Cl. 354-106.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Oe, Takanori; and Tsuruda, Mineo, 4,085,111, Cl. 260-296.00H.

Young, Duane A.: *See*—
Palm, William A.; and Young, Duane A., 4,085,383, Cl. 330-295.000.

Younger, Lloyd. Apparatus and method for sowing second crop in standing crop. 4,084,522, Cl. 111-14.000.

Youngquist, Rex Veech. Electric water heater for showers. 4,085,308, Cl. 219-309.000.

Yu, Ying-Nien, to Ying Mfg. Corporation. Lightweight solar heater employing tubes and channels. 4,084,579, Cl. 126-271.000.

Yver, Jacques, to Metallurgie Francaise des Poudres-Metafram. Apparatus for producing horizontal and vertical reciprocation movement of a transfer arm. 4,084,710, Cl. 214-1.0BB.

Zadina, Alfred, to Viennatone Gesellschaft m.b.H. Drive for an orthosis or a prosthesis. 4,084,267, Cl. 3-1.100.

Zahnradfabrik Friedrichshafen AG: *See*—
Schlitz, Robert, 4,084,374, Cl. 60-330.000.
Stumpp, Bernard, 4,084,917, Cl. 407-114.000.

Zaitsev, Aron Iosifovich: *See*—
Kaminsky, Igor Viktorovich; Shestakov, Vladimir Vladimirovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; Litvinenko, Alexandr Fedorovich; Melnikov, Viktor Vasilievich; Zats, Boris Semenovich; Miropolsky, Mark Usherovich; and Maizlik, David Lvovich, 4,085,051, Cl. 210-333.00R.

Zak, Dennis Joseph, to Du Pont de Nemours, E. I., and Company. Butynediol production. 4,085,151, Cl. 260-635.00Y.

Zalabak, Vladislav: *See*—
Rokos, Josef; Kubat, Zdenek; Prochazka, Pavel; Zalabak, Vladislav; Babicka, Josef, deceased; Janecek, Jiri; Nohynek, Miroslav; and Mison, Petr, 4,085,206, Cl. 424-131.000.

Zamboni, Frank J., to Frank J. Zamboni & Co. Machine for handling artificial turf or the like. 4,084,763, Cl. 242-86.520.

Zats, Boris Semenovich: *See*—
Kaminsky, Igor Viktorovich; Shestakov, Vladimir Vladimirovich; Severov, Genrikh Fedorovich; Zaitsev, Aron Iosifovich; Litvinenko, Alexandr Fedorovich; Melnikov, Viktor Vasilievich; Zats, Boris Semenovich; Miropolsky, Mark Usherovich; and Maizlik, David Lvovich, 4,085,051, Cl. 210-333.00R.

Zboril, Josef, to BBC Brown Boveri & Company Limited. Arrangement for maintaining optimum minimum operating clearance between rotor and stator components of fluid-flow machines and method of operating the same. 4,084,920, Cl. 415-174.000.

Zehender, Ernst; Blaich, Bernhard; Stein, Helmut; and Kerner, Karl, to Robert Bosch GmbH. Method to apply a protective layer to the surface of optical reflectors, and so-made reflectors, particularly automotive vehicle head lamps. 4,085,248, Cl. 428-336.000.

Zenk, George Edward; Johnson, Robert Joseph; and Miller, Charles Newell, to Control Data Corporation. Membrane-type touch panel. 4,085,302, Cl. 200-5.00A.

Zermeno, Alfonso; Marsh, Lee M., Jr.; and Hevezi, James M., to University of Texas, The. Imaging by point absorption of radiation. 4,085,324, Cl. 250-320.000.

Zieher, Peter: *See*—
Kubach, Hans; and Zieher, Peter, 4,085,379, Cl. 330-69.000.

Zilges, Franz Josef; and Siegert, Klaus, to Schloemann-Siemag Aktiengesellschaft. Extrusion press. 4,084,422, Cl. 72-253.00R.

Zinsser, Rudolf G., to Reuter Technologie GmbH. Circuit for producing pulses by differentiating output of sawtooth oscillator. 4,085,384, Cl. 331-74.000.

Zmoda, Barney J., to Colgate-Palmolive Company. Audibly burning gelled alcohol. 4,084,939, Cl. 44-7.00C.

Zoberis, Walter B.: *See*—
Kerwin, Daniel; Zoberis, Walter B.; Grec, John W.; and McDonald, James A., 4,084,501, Cl. 101-76.000.

Zollinger, Joseph La Mar: *See*—
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, 4,085,137, Cl. 260-561.0HL.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF APRIL, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fullerton, Baxter T., to Warner & Swasey Company, The. Machine tool with indexible tool support. Re. 29,612, Cl. 29-47.000.

Kropfhammer, Georg. Inhaler apparatus. Re. 29,613, Cl. 128-203.000.

Lawrence, James Roger, to Steadley Company, Inc. Bed base for supporting a box spring. Re. 29,611, Cl. 5-200.00R.

Nippon Kogaku K.K.: *See*—
Toyoda, Kenji, Re. 29,615, Cl. 354-60.00E.

Protectoseal Co., The: *See*—
Zehr, William J., Re. 29,614, Cl. 169-26.000.

Steadley Company, Inc.: *See*—
Lawrence, James Roger, Re. 29,611, Cl. 5-200.00R.

Toyoda, Kenji, to Nippon Kogaku K.K. Off-photometric-range indicator for exposure meter. Re. 29,615, Cl. 354-60.00E.

Warner & Swasey Company, The: *See*—
Fullerton, Baxter T., Re. 29,612, Cl. 29-47.000.

Zehr, William J., to Protectoseal Co., The. Rupturing head for fire extinguishers. Re. 29,614, Cl. 169-26.000.

LIST OF PLANT PATENTEES

Blow, Elizabeth Parris; and Steppe, Muriel Fiscus. Dogwood tree — imperial white variety. 4,242, 4-18-78, Cl. 51.000.

Carlton Rose Nurseries, Inc.: *See*—
Van Veen, Jan, 4,241, Cl. 18.000.

Steppe, Muriel Fiscus: *See*—
Blow, Elizabeth Parris; and Steppe, Muriel Fiscus, 4,242, Cl. 51.000.

Van Veen, Jan, to Carlton Rose Nurseries, Inc. Rose plant. 4,241, 4-18-78, Cl. 18.000.

LIST OF DESIGN PATENTEES

Alexander, Mark A.; and Speers, Samuel F., to Ralston Purina Company. Dog food scoop. 247,737, 4-18-78, Cl. D7-104.000.

Appleby, William Edward, to Tubular Barriers Limited. Portable crowd control barricade or the like. 247,751, 4-18-78, Cl. D25-45.000.

Archer, Timothy H., to Mead Corporation, The. Type font. 247,758, 4-18-78, Cl. D64-12.00B.

Atari, Inc.: *See*—
Hall, Randy K., 247,746, Cl. D13-38.000.

Brady, Frank A., to General Time Corporation. Combined clock and case. 247,740, 4-18-78, Cl. D10-18.000.

Chicago Cutlery Consumer Products, Inc.: *See*—
Gangelhoff, Fred R., 247,736, Cl. D7-74.000.
Gangelhoff, Ronald J.; and Jacobi, Robert L., 247,735, Cl. D7-74.000.

Compagnie Generale des Etablissements Michelin: *See*—
Duchamp, Marcel, 247,744, Cl. D12-137.000.

Crenshaw, John C.: *See*—
Danz, Ellworth R.; and Crenshaw, John C., 247,741, Cl. D10-23.000.

Danz, Ellworth R.; and Crenshaw, John C., to General Time Corporation. Clock. 247,741 4-18-78, Cl. D10-23.000.

Davidson, Charles. Wrist watch. 247,742, 4-18-78, Cl. D10-39.000.

Donato, Anthony C.; and Thurston, Gerald, to Lightolier Incorporated. Shelf light. 247,757, 4-18-78, Cl. D48-20.00E.

Duchamp, Marcel, to Compagnie Generale des Etablissements Michelin. Tire. 247,744, 4-18-78, Cl. D12-137.000.

Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, to Milgo Electronics Corporation. Display monitor or similar article. 247,748, 4-18-78, Cl. D14-43.000.

Esselte Obergs AB: *See*—
Winther, Ole, 247,759, Cl. D87-1.00D.

Fairchild Camera and Instrument Corporation: *See*—
Talesfore, Nicholas F., 247,754, Cl. D34-5.00R.
Talesfore, Nicholas F., 247,755, Cl. D34-5.00R.

Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, to Plath, C. Sextant. 247,743, 4-18-78, Cl. D10-65.000.

Fleig, Mario: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.

Gangelhoff, Fred R., to Chicago Cutlery Consumer Products, Inc. Holder for cutlery and sharpener. 247,736, 4-18-78, Cl. D7-74.000.

Gangelhoff, Ronald J.; and Jacobi, Robert L., to Chicago Cutlery Consumer Products, Inc. Holder for cutlery and sharpening steel. 247,735, 4-18-78, Cl. D7-74.000.

General Time Corporation: *See*—
Brady, Frank A., 247,740, Cl. D10-18.000.
Danz, Ellworth R.; and Crenshaw, John C., 247,741, Cl. D10-23.000.

Grothkopp, Friedrich: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.

Hall, Randy K., to Atari, Inc. Hand held control unit. 247,746, 4-18-78, Cl. D13-38.000.

Halliwell, James A. D. Combined shirt and cravat. 247,726, 4-18-78, Cl. D2-209.000.

Hein, Peter: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.

J. R. Clark Company, The: *See*—
Ryan, Delvin Richard, Jr., 247,734, Cl. D7-43.000.

Jacobi, Robert L.: *See*—
Gangelhoff, Ronald J.; and Jacobi, Robert L., 247,735, Cl. D7-74.000.

Kobayashi, Minoru: *See*—
Nemoto, Shigeru; and Kobayashi, Minoru, 247,747, Cl. D14-6.000.

Lee, Shun-Chi: *See*—
Lu, Tien-Pao; and Lee, Shun-Chi, 247,750, Cl. D23-65.000.

Lightolier Incorporated: *See*—
Donato, Anthony C.; and Thurston, Gerald, 247,757, Cl. D48-20.00E.

Lu, Tien-Pao; and Lee, Shun-Chi. Flush toilet. 247,750, 4-18-78, Cl. D23-65.000.

Mead Corporation, The: *See*—
Archer, Timothy H., 247,758, Cl. D64-12.00B.

Milgo Electronics Corporation: *See*—
Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, 247,748, Cl. D14-43.000.

Mitchell, Thomas R. Bedstead. 247,727, 4-18-78, Cl. D6-83.000.

Montgomery, William P.: *See*—
Paone, Anthony N.; and Montgomery, William P., 247,739, Cl. D9-187.000.

Nagelkerke, Petrus Jacobus Johanna, to U.S. Philips Corporation. Sun lamp. 247,756, 4-18-78, Cl. D48-20.00H.

Nemoto, Shigeru; and Kobayashi, Minoru, to Olympus Optical Company Ltd. Tape recorder. 247,747, 4-18-78, Cl. D14-6.000.

Nichols, Brian H. Slotted container for receiving paid bills or the like. 247,728, 4-18-78, Cl. D6-127.000.

Ohtomo, Kazuhito, to Sansui Electric Co., Ltd. Tuner. 247,749, 4-18-78, Cl. D14-71.000.

Olympus Optical Company Ltd.: *See*—
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Paone, Anthony N.; and Montgomery, William P., to SCM Corpora-

tion. Dual ribbon cartridge shipping tray. 247,739, 4-18-78, Cl. D9-187.000.
Pizzeri, Francis Charles: *See*—
Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, 247,748, Cl. D14-43.000.
Plath, C.: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.
Rahn, Armin: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.
Ralston Purina Company: *See*—
Alexander, Mark A.; and Speers, Samuel F., 247,737, Cl. D7-104.000.
Rausch, Gunter, to Rollei-Werke Franke & Heidecke. Carrying case for a photographic camera. 247,760, 4-18-78, Cl. D87-5.00E.
Regie Nationale des Usines Renault: *See*—
Tixier, Michel, 247,745, Cl. D12-172.000.
Robinson, A. Fuller. Credenza. 247,729, 4-18-78, Cl. D6-159.000.
Robinson, A. Fuller. Desk. 247,730, 4-18-78, Cl. D6-161.000.
Robinson, A. Fuller. Desk. 247,731, 4-18-78, Cl. D6-161.000.
Robinson, A. Fuller. Desk. 247,732, 4-18-78, Cl. D6-161.000.
Robinson, A. Fuller. Table. 247,733, 4-18-78, Cl. D6-177.000.
Rollei-Werke Franke & Heidecke: *See*—
Rausch, Gunter, 247,760, Cl. D87-5.00E.
Ryan, Delvin Richard, Jr., to J. R. Clark Company, The. Pretzel pan. 247,734, 4-18-78, Cl. D7-43.000.
Rynearson, Charles H. Stud mounted bracket. 247,738, 4-18-78, Cl. D8-354.000.
Sansui Electric Co., Ltd.: *See*—
Ohtomo, Kazuhito, 247,749, Cl. D14-71.000.
Schneider, Lorenz: *See*—
Finnern, Gerd; Fleig, Mario; Grothkopp, Friedrich; Hein, Peter; Rahn, Armin; and Schneider, Lorenz, 247,743, Cl. D10-65.000.
SCM Corporation: *See*—
Paone, Anthony N.; and Montgomery, William P., 247,739, Cl. D9-187.000.
Speers, Samuel F.: *See*—
Alexander, Mark A.; and Speers, Samuel F., 247,737, Cl. D7-104.000.
Sprecher, Charles Grimes: *See*—
Ebner, John Steven; Pizzeri, Francis Charles; and Sprecher, Charles Grimes, 247,748, Cl. D14-43.000.
Talesfore, Nicholas F., to Fairchild Camera and Instrument Corporation. Hand-held controller for a video game or the like. 247,754, 4-18-78, Cl. D34-5.00R.
Talesfore, Nicholas F., to Fairchild Camera and Instrument Corporation. Video game console. 247,755, 4-18-78, Cl. D34-5.00R.
Thurston, Gerald: *See*—
Donato, Anthony C.; and Thurston, Gerald, 247,757, Cl. D48-20.00E.
Tixier, Michel, to Regie Nationale des Usines Renault. Side wing of a car bumper. 247,745, 4-18-78, Cl. D12-172.000.
Tubular Barriers Limited: *See*—
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ISSUED APRIL 18, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

2 4,084,264
163 4,084,265

CLASS 3

1 4,084,266
1.1 4,084,267
1.5 4,084,268

CLASS 4

111 4,084,269
145 4,084,270
161 4,084,271
172.17 4,084,272

CLASS 5

61 4,084,274
81 R 4,084,275
105 4,084,273
118 4,084,276
200 R Re.29,611
331 4,084,277

CLASS 10

76 T 4,084,278

CLASS 12

142 R 4,084,279

CLASS 15

22 R 4,084,280
29 4,084,281
38 4,084,282
48 4,084,283
79 A 4,084,284
87 4,084,285
104.93 4,084,286
210 R 4,084,287

CLASS 16

21 4,084,288
96 R 4,084,289
4,084,290
170 4,084,291

CLASS 17

50 4,084,292
52 4,084,293
57 4,084,294

CLASS 21

2.7 R 4,084,936

CLASS 23

259 4,084,937

CLASS 24

95 4,084,295
205.13 4,084,296
205.13 C 4,084,297
230 AL 4,084,298
250 4,084,299

CLASS 29

26 A 4,084,300
33 K 4,084,301
47 Re.29,612
148.4 D 4,084,302
4,084,303
157.1 R 4,084,304
261 4,084,305
431 4,084,306
460 4,084,307
527.2 4,084,308
561 4,084,309
564.4 4,084,310
571 4,084,311
588 4,084,312
593 4,084,313
626 4,084,314
740 4,084,315

CLASS 30

47 4,084,316
94 4,084,317

CLASS 32

10 A 4,084,318
21 4,084,319
60 4,084,320

CLASS 33

86 4,084,321
115 4,084,329
174 L 4,084,322
4,084,323
4,084,324
191 4,084,325
245 4,084,326
299 4,084,327
368 4,084,328

CLASS 34

92 4,084,330

CLASS 35

8 R 4,084,331
9 G 4,084,332

CLASS 36

43 4,084,333

CLASS 37

67 4,084,334
126 AE 4,084,335
184 4,084,336

CLASS 40

472 4,084,337
560 4,084,339
592 4,084,338

CLASS 42

1 N 4,084,340
1 Y 4,084,341

CLASS 43

19.2 4,084,342
22 4,084,343

CLASS 44

1 R 4,084,938
7 C 4,084,939
51 4,084,940

CLASS 46

28 4,084,344
75 4,084,345

CLASS 47

1.4 4,084,346

CLASS 49

397 4,084,347
475 4,084,348

CLASS 51

5 D 4,084,349
106 R 4,084,350
109 R 4,084,351
127 4,084,352
220 4,084,353
283 R 4,084,354
295 4,084,941
307 4,084,942
313 4,084,355
328 4,084,356
419 4,084,357

CLASS 52

4 4,084,358
40 4,084,359
63 4,084,360
204 4,084,361
309.2 4,084,362
309.4 4,084,363
484 4,084,364
529 4,084,365
615 4,084,366
4,084,367
728 4,084,368

CLASS 53

112 A 4,084,390
120 4,084,391
131 4,084,392
137 4,084,393

CLASS 55

17 4,084,943
27 4,084,944
38 4,084,945
184 4,084,946
242 4,084,947
366 4,084,948
524 4,084,949

CLASS 56

14.6 4,084,394
15.4 4,084,395
98 4,084,396
255 4,084,397

CLASS 57

34 R 4,084,398
140 C 4,084,399
156 4,084,400

CLASS 58

4 A 4,084,401
23 D 4,084,403
23 R 4,084,402
50 R 4,084,404

CLASS 59

7 4,084,369
78.1 4,084,370

CLASS 60

39.36 4,084,371
278 4,084,372
293 4,084,373
330 4,084,374
496 4,084,375
523 4,084,376
535 4,084,377
602 4,084,378
641 4,084,379

CLASS 61

1 F 4,084,380
36 C 4,084,381
36 R 4,084,382
4,084,383
42 4,084,384
53.5 4,084,385
85 4,084,386

CLASS 62

63 4,084,387
152 4,084,388
179 4,084,389
197 4,084,405
211 4,084,406
342 4,084,407
467 R 4,084,408

CLASS 64

11 B 4,084,409
12 4,084,410
19 4,084,411

CLASS 68

5 C 4,084,412
189 4,084,413

CLASS 70

181 4,084,414
269 4,084,415
276 4,084,416
431 4,084,417

CLASS 71

67 4,084,950
86 4,084,951
4,084,952
4,084,953
90 4,084,954
92 4,084,955
111 4,084,956

CLASS 72

31 4,084,418
68 4,084,419
138 4,084,420
231 4,084,421
253 R 4,084,422
256 4,084,423
389 4,084,424

CLASS 73

32 A 4,084,425
60.1 4,084,426
88 A 4,084,427
117.3 4,084,428
139 4,084,429
141 R 4,084,430
146.2 4,084,431
148 4,084,432
159 4,084,433
160 4,084,434
299 4,084,435
313 4,084,436
361 4,084,437
422 GC 4,084,440
425.4 R 4,084,441
432 PS 4,084,442
517 R 4,084,443
622 4,084,444
706 4,084,438
718 4,084,439

CLASS 74

61 4,084,445
4,084,446
89.14 4,084,447
475 4,084,448
480 R 4,084,449
713 4,084,450
867 4,084,451

CLASS 75

3 4,084,957
36 4,084,958
53 4,084,959
58 4,084,960
101 R 4,084,961
130 A 4,084,962
138 4,084,963
171 4,084,964
230 4,084,965

CLASS 76

42 4,084,452

CLASS 81

10 4,084,460
57.18 4,084,453
121 R 4,084,454
140 4,084,455
177.8 4,084,456
425 R 4,084,457

CLASS 82

1 C 4,084,458
4,084,459
21 B 4,084,461
36 R 4,084,462
53.1 4,084,463

CLASS 83

94 4,084,464
103 4,084,465
193 4,084,466
208 4,084,467
542 4,084,469
841 4,084,470

CLASS 84

1.01 4,084,471
4,084,472
1.14 4,084,473
1.27 4,084,474
291 4,084,475
293 4,084,476
327 4,084,477
500 4,084,468

CLASS 85

45 4,084,478

CLASS 87

48 4,084,479

CLASS 89

42 B 4,084,480

CLASS 90

1.6 R 4,084,481
11 R 4,084,482
13.3 4,084,483
24 C 4,084,484

CLASS 91

210 4,084,485
276 4,084,486
325 4,084,487

CLASS 93

36 B 4,084,488
36.8 4,084,489
55.1 R 4,084,490

CLASS 96

1 PS 4,084,966
29 R 4,084,967
48 PD 4,084,968
60 R 4,084,969
88 4,084,970

CLASS 98

121 A 4,084,491

CLASS 99

330 4,084,492
450.7 4,084,493
4,084,494

CLASS 100

34 4,084,495
35 4,084,496
53 4,084,497
210 4,084,498
231 4,084,499

CLASS 101

28 4,084,500
76 4,084,501
93.29 4,084,502
96 4,084,503
110 4,084,507
115 4,084,504
123 4,084,505
127 4,084,506
142 4,084,508
261 4,084,509
365 4,084,510

CLASS 102

70.2 GA 4,084,511
103 4,084,512

CLASS 105

197 DB 4,084,513
4,084,514
240 4,084,515
368 R 4,084,516

CLASS 106

1.17 4,084,971
39.7 4,084,972
4,084,973
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48 4,084,975
4,084,976
50 4,084,977
54 4,084,978
58 4,084,979
75 4,084,980
96 4,084,981
105 4,084,982
289 4,084,983
300 4,084,984

CLASS 108

153 4,084,517

CLASS 109

19 4,084,518
42 4,084,519
56 4,084,520

CLASS 110

242 4,084,521

CLASS 111

14 4,084,522

CLASS 112

158 A 4,084,523
158 B 4,084,524

CLASS 113

1 K 4,084,525
116 E 4,084,526

CLASS 114

36 4,084,527
45 4,084,528
46 4,084,529
125 4,084,534
183 R 4,084,530
211 4,084,531
218 4,084,532
219 4,084,533
222 4,084,535

CLASS 115

16 4,084,536
50 4,084,537

CLASS 118

4 4,084,538
8 4,084,539
48 4,084,540
421 4,084,541
658 4,084,542

CLASS 119

3 4,084,543
103 4,084,544

CLASS 122

4 D 4,084,545
32 4,084,546
504 4,084,547

CLASS 123

32 EA 4,084,552
32 SP 4,084,551
48 B 4,084,553
52 MF 4,084,554
58 AA 4,084,555
75 B 4,084,556
90.15 4,084,557
97 B 4,084,558
102 4,084,559
103 C 4,084,561
119 EC 4,084,560
4,084,562
4,084,563
139 AV 4,084,564
140 MP 4,084,565
148 E 4,084,566
4,084,567
182 4,084,568
205 4,084,548
217 4,084,549
245 4,084,550

CLASS 125

23 R 4,084,569

CLASS 126

140 4,084,570
198 4,084,571
200 4,084,572
270 4,084,573
4,084,574
4,084,575
4,084,576
271 4,084,577
4,084,578
4,084,579
4,084,580
4,084,581

CLASS 128

2 V 4,084,582
2.06 R 4,084,583
80 C 4,084,584
146.2 4,084,585
157 4,084,586
193 4,084,587
203 Re.29,613
218 R 4,084,588
278 4,084,589
283 4,084,590
285 4,084,591
287 4,084,592
295 4,084,593
311 4,084,594
422 4,084,595

CLASS 131

17 R 4,084,596

CLASS 135

1 R 4,084,597
3 E 4,084,598
4 R 4,084,599
20 R 4,084,600

CLASS 136

89 P 4,084,985

CLASS 137

1 4,084,610
49 4,084,601
68 A 4,084,602
88 4,084,603
101 4,084,604
101.11 4,084,605
102 4,084,606
312 4,084,607
316 4,084,608
327 4,084,609
454.2 4,084,611

484.2 4,084,612
596.18 4,084,613
614.03 4,084,614
624.11 4,084,615
625.28 4,084,617
625.4 4,084,616
625.48 4,084,618
636.2 4,084,619
801 4,084,620

CLASS 138

30 4,084,621

CLASS 139

420 R 4,084,622
435 4,084,623

CLASS 140

80 4,084,624
123.5 4,084,625

CLASS 141

7 4,084,626
11 4,084,627
284 4,084,628

CLASS 144

134 D 4,084,629

CLASS 148

1.5 4,084,986
4,084,987
9.5 4,084,988
11.5 R 4,084,989
4,084,990
31.5 4,084,991

CLASS 149

17 4,084,992
39 4,084,993
44 4,084,994
56 4,084,995

CLASS 151

5 4,084,630

CLASS 156

257 4,084,996
356 4,084,997
403 4,084,998
466 4,084,999

CLASS 162

16 4,085,000
145 4,085,001
238 4,085,002
259 4,085,003

CLASS 164

4 4,084,631
72 4,084,632

CLASS 165

8 4,084,633
9 4,084,634
107 4,084,635

CLASS 166

65 M 4,084,636
245 4,084,637
248 4,084,638
4,084,639
259 4,084,640

CLASS 169

26 Re.29,614

CLASS 172

9 4,084,641
21 4,084,642
795 4,084,643
796 4,084,644

CLASS 173

13 4,084,645
17 4,084,646
73 4,084,647

CLASS 174

36 4,085,284
68.5 4,085,285
92 4,085,286

CLASS 175

67 4,084,648
366 4,084,649

CLASS 176

22 4,085,004

CLASS 177

174 4,084,650
192 4,084,651
207 4,084,652

CLASS 178

66 R 4,085,287
69.1 4,085,288

CLASS 179

1 GQ 4,085,291
1 VE 4,085,289
1. CN 4,085,290
2 A 4,085,292
8 A 4,085,293
16 AA 4,085,294
84 VF 4,085,295
100.3 R 4,085,296
111 R 4,085,297
175.3 R 4,085,298
184 4,085,299

CLASS 180

9.48 4,084,653
44 R 4,084,654
69.1 4,084,655
103 R 4,084,656
105 E 4,084,659
114 4,084,657

CLASS 181

241 4,084,658

CLASS 187

26 4,084,660
29 R 4,084,661
4,084,662

CLASS 188

31 4,084,663
71.9 4,084,664
73.3 4,084,665
4,084,666
275 4,084,667
312 4,084,668

CLASS 191

45 R 4,084,669

CLASS 192

13 R 4,084,670
30 W 4,084,671
67 A 4,084,673
89 B 4,084,674
95 4,084,675
055 4,084,672

CLASS 194

87 4,084,676
100 A 4,084,677

CLASS 195

68 4,085,005
103.7 4,085,006
109 4,085,007

CLASS 197

1 R 4,084,678
6.7 4,084,679
19 4,084,680
82 4,084,681
168 4,084,682
170 4,084,683

CLASS 198

461 4,084,685
467 4,084,684
468 4,084,686
844 4,084,687

CLASS 200

4 4,085,301
5 A 4,085,302
61.41 4,085,303
61.45 R 4,085,304
83 A 4,085,305
275 4,085,306

CLASS 202

151 4,085,008

CLASS 204

1 T 4,085,009
16 4,085,010
37 R 4,085,011
38 A 4,085,012
51 4,085,013
95 4,085,014
98 4,085,015
104 4,085,016
123 4,085,017
159.15 4,085,018
159.23 4,085,019
181 C 4,085,020
181 N 4,085,021
192 E 4,085,022
195 R 4,085,024
195 S 4,085,023
224 M 4,085,025
242 4,085,026
268 4,085,027
269 4,085,028

CLASS 206

188 4,084,688
280 4,084,689
310 4,084,690
313 4,084,691
403 4,084,692
427 4,084,693
444 4,084,694
532 4,084,695
629 4,084,696

CLASS 208

8 4,085,029
4,085,030
4,085,031
10 4,085,032
4,085,033
48 R 4,085,034
143 4,085,035
212 4,085,036

CLASS 209

1 4,085,037
71 4,085,038
106 4,084,697
121 4,084,698
220 4,085,039
244 4,085,040

CLASS 210

7 4,085,041
33 4,085,042
40 4,085,043
45 4,085,044
58 4,085,045
90 4,085,046
96 M 4,085,047
242 S 4,085,049
321 R 4,085,048
332 4,085,050
333 R 4,085,051

CLASS 211

11 4,084,699
41 4,084,700
81 4,084,701
88 4,084,702
153 4,084,703

CLASS 213

100 W 4,084,704
127 4,084,705

CLASS 214

1 BB 4,084,709
4,084,710
1 D 4,084,706
1 HA 4,084,707
4,084,708
1 HH 4,084,711
35 R 4,084,712
85 4,084,713
515 4,084,714
660 4,084,715

CLASS 215

217 4,084,716
4,084,717
247 4,084,718
256 4,084,719

CLASS 219

10.49 R 4,085,300
98 4,085,307
309 4,085,308
364 4,085,309
502 4,085,310

CLASS 220

76 4,084,720
269 4,084,721
270 4,084,722
277 4,084,723

CLASS 221

20 4,084,724
75 4,084,725
266 4,084,726
298 4,084,727

CLASS 222

153 4,084,728
307 4,084,729
309 4,084,730
380 4,084,731
402.17 4,084,732

CLASS 223

78 4,084,733

CLASS 224

2 B 4,084,734
42.03 B 4,084,736
42.1 E 4,084,735

CLASS 225

2 4,084,737

CLASS 227

7 4,084,738

CLASS 228

168 4,084,739

CLASS 229

23 R 4,084,740
69 4,084,741

CLASS 235

92 FP 4,085,311
306 4,085,312
419 4,084,742
4,085,313
487 4,085,314

CLASS 236

1 G 4,084,743
49 4,084,744

CLASS 237

8 R 4,084,745

CLASS 238

10 F 4,084,746

CLASS 239

4 4,084,747
74 4,084,748
271 4,084,749
600 4,084,750

CLASS 241

25 4,084,751
30 4,084,752
34 4,084,753
52 4,084,754
95 4,084,755
213 4,084,756
301 4,084,757

CLASS 242

18 A 4,084,760
18 G 4,084,758
18 PW 4,084,759
58.6 4,084,761
68.3 4,084,762
86.52 4,084,763
107 4,084,764
107.4 B 4,084,765
129.62 4,084,766
164 4,084,767
186 4,084,768

CLASS 243

3 4,084,769
25 4,084,770

CLASS 244

31 4,084,771
165 4,084,772
166 4,084,773
194 4,084,774

CLASS 248

188.7 4,084,776
287 4,084,777
314 4,084,778
318 4,084,779

CLASS 249

59 4,084,780
83 4,084,781
135 4,084,782
175 4,084,783

CLASS 250

199 4,085,319
201 4,085,320
211 R 4,085,321
227 4,085,322
252 4,085,323
320 4,085,324
328 4,085,325
339 4,085,326
370 4,085,327
416 TV 4,085,328
492 A 4,085,329
4,085,330
493 4,085,331
528 4,085,332

CLASS 251

147 4,084,784
172 4,084,785
250 4,084,786

CLASS 252

8.6 4,085,052
32.7 E 4,085,053
49.3 4,085,054
50 4,085,055
59 4,085,056
62.1 L 4,085,058
62.1 P 4,085,057
118 4,085,059
180 4,085,060
300 4,085,062
301.1 W 4,085,061
387 4,085,063
429 B 4,085,064
429 R 4,085,070
434 4,085,066
437 4,085,065
442 4,085,067
455 R 4,085,068
455 Z 4,085,069
470 4,085,131

CLASS 254

57 4,084,787
76 4,084,788
86 R 4,084,789
90 4,084,790
101 4,084,791
106 4,084,792
187.8 4,084,793
189 4,084,794

CLASS 260

2.5 AC 4,085,072
2.5 E 4,085,073
17 R 4,085,074
17.2 4,085,075
4,085,076
22 R 4,085,071
23 XA 4,085,077
28.5 AS 4,085,078
29.6 B 4,085,079
31.2 N 4,085,080
31.4 R 4,085,081
31.6 4,085,082
4,085,083
33.6 SB 4,085,084
38 4,085,085
40 TN 4,085,086
42.49 4,085,087
45.7 R 4,085,088
45.8 NT 4,085,089
49 4,085,090
75 R 4,085,091
77.5 AN 4,085,092
79.5 B 4,085,094
79.5 P 4,085,093
112 B 4,085,095
112.5 LH 4,085,096
145 A 4,085,097
157 4,085,098
207 4,085,099
239 A 4,085,100
239.9 4,085,101
250 C 4,085,103
251 A 4,085,105
251 R 4,085,104
256.4 F 4,085,106
256.4 Q 4,085,107
283 SC 4,085,108
294.8 B 4,085,110
294.8 E 4,085,109
296 H 4,085,111
304 C 4,085,112
306.7 C 4,085,113
307 DA 4,085,114
308 D 4,085,115
4,085,116
332.2 A 4,085,117
343 4,085,119
343.6 4,085,118
4,085,120
346.75 4,085,121
4,085,122
349 4,085,123
396 N 4,085,124
402 4,085,125
404 4,085,126
413 4,085,127
456 A 4,085,128
463 4,085,129
465.2 4,085,130
502 R 4,085,133
502.5 4,085,134
515 R 4,085,143
520 C 4,085,135
559 D 4,085,136
561 HL 4,085,137
563 R 4,085,138
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566 R 4,085,140
570 R 4,085,141
570.5 CA 4,085,142
584 R 4,085,144
592 4,085,145
600 R 4,085,146
4,085,147
601 H 4,085,148
613 R 4,085,149
621 R 4,085,150
635 Y 4,085,151
645 4,085,152
649 R 4,085,153
668 D 4,085,154
668 R 4,085,155
671 R 4,085,156
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680 E 4,085,158
835 4,085,159
837 R 4,085,160
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848 4,085,162
857 D 4,085,163
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859 R 4,085,165
876 R 4,085,166
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CLASS 261

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CLASS 264

1 4,085,172
3 R 4,085,173
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51 4,085,175
82 4,085,176
89 4,085,177
106 4,085,178
122 4,085,179
128 4,085,180
158 4,085,181
171 4,085,182
174 4,085,183
219 4,085,184
248 4,085,185
268 4,085,186
280 4,085,187

CLASS 266

106 4,084,797
131 4,084,798
207 4,084,799
225 4,084,800

CLASS 267

140 4,084,801

CLASS 269

41 4,084,802
91 4,084,803

CLASS 270

52.5 4,084,804

CLASS 271

4 4,084,805
80 4,084,806
119 4,084,807
213 4,084,808
220 4,084,809

CLASS 272

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76 4,084,811
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DESIGN PATENTS

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12 : 247,736
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17 : 247,741
18 : 247,734
22 : 247,727

25 : 247,737
27 : 247,728
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34 : 247,757
36 : 247,739
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